Business Intelligence: Ontario's Computer Animation and Visual Effects Companies, 2018

Final Report

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CASO

COMPUTER ANIMATION STUDIOS OF ONTARIO

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Contents

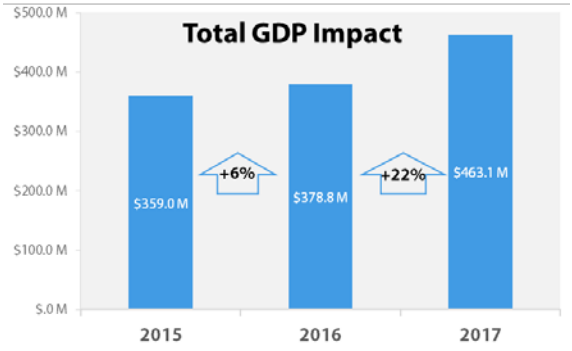
1. Introduction 6
   - 1.1 Approach and Methodology 6
   - 1.2 About this Report 8
2. Global Market and Industry 9
   - 2.1 About the Computer Animation and VFX Industry 9
   - 2.2 Global, Mainstream Environment 14
   - 2.3 SVOD Services Driving Global Demand 15
   - 2.4 Resurgence of Animation for Adults 16
   - 2.5 VR/AR/XR 17
3. Ontario's Computer Animation and VFX Industry: Profile 19
   - 3.1 About Ontario's Computer Animation and VFX Companies 19
   - 3.2 Recent Developments 21
   - 3.3 Tax Credits 25
   - 3.4 Competition: International and Domestic 28
4. Ontario's Computer Animation and VFX Industry: Financial and Economic Overview 31
   - 4.1 Financial Profile 31
   - 4.2 GDP Impact 36
   - 4.3 Fiscal Impact 38
5. Ontario's Computer Animation and VFX Industry: Employment and Skills 40
   - 5.1 About the Workforce 40
   - 5.2 Direct and Spin-off Employment Impact 41
   - 5.3 Skills and Education 43
6. Strategic Outlook for Ontario's Computer Animation and VFX Industry 45
   - 6.1 Challenges Facing the Industry 45
   - 6.2 Opportunities Going Forward 46

Executive Summary

From *Ferdinand* to *Game of Thrones* to *The Shape of Water*, it is hard to imagine contemporary film and television without the contributions of computer animation and visual effects (VFX). Creative and technical contributions of companies in this industry can be crucial to the critical and financial success of any audiovisual property.

Contributing to Ontario's Prosperity

Computer animation and VFX companies in Ontario make economic contributions to the province which can be quantified in terms of GDP, employment and taxes. In 2017, the industry contributed:



- **$309 million in direct GDP impact** of the industry's activities;[1]
- **$463.1 million in total GDP impact** considering the industry's impacts on Ontario's wider economy;[2]
- **A total of 6,580 FTEs** in direct and spin-off employment;
- **$69.6 million** in **federal taxes** and **$72.4 million** in **provincial taxes;**
- **39% more in total GDP impact** as compared to 2015.

Over the last three years, the **Ontario Computer Animation & Special Effects (OCASE)** tax credit has become a more efficient means of industry support than it was in 2015. For every **$100,000 of tax credit expenditure**, the industry produced **$1 million in direct GDP** impact in 2017, compared to $726,000 per $100,000 invested in 2015.

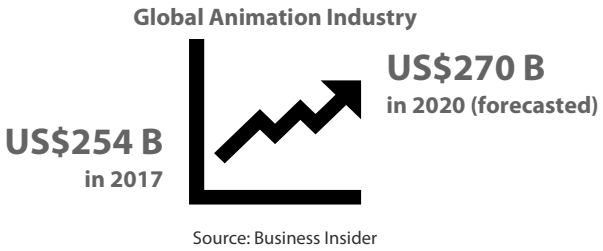
The continued utility of the credit rests, in part, in the ability of Ontario-based companies to predict how OCASE will be administered – and so how it integrates into their respective business strategies.

[1] Direct economic impact is based on a combination of a portion of an industry's direct output and the wages it pays to its employees.

[2] Total economic impact refers to the sum of the direct impact, the indirect impact (spending stimulated in other industries), and the induced impact (spending by individuals in other industries stimulated by this industry).

Global Opportunity

There are three key factors contributing to the growing global opportunity for Ontario's computer animation and VFX companies:



1. Computer-generated content has become an integral component of many entertainment products, and producers and studios continue to spend huge amounts on VFX.
2. Non-Canadian subscription-video-on-demand (SVOD) services are helping to drive demand for production of all types of linear audiovisual entertainment, including for animated content for children and adults.
3. Advancements in technology have created new avenues for storytelling (VR/AR/XR), and have allowed for more flexibility, cost savings, and time savings.

Capturing (Global) Growth at Home

Companies have demonstrated their ability to **cater to a global market**, making a large majority of their revenue (70%) from outside of Canada. The industry generates 53% of its revenue from the US, and 10% of its revenue from China. At the same time, the industry in Ontario enjoys proximity to a large production base in Toronto and a diverse labour pool with dependable supply. In 2017:

- Total **revenue** earned by the industry is estimated to be **$416.7 million** and total **expenditure** is estimated to be **$350.7 million.**
- The industry's overall **operating margin** is estimated to be **$66 million**, or **16%**.

While revenue has increased since 2015, margins have declined slightly over the last three years likely due to tighter project budgets, competition, and customer expectations for higher production values.

Evolving to Thrive

Many studios have adapted to changes in the marketplace and technology in a variety of ways – **specializing** in a product, genre or segment, by **focusing on digital platforms**, or by taking on **producer roles**. Often such specialization involves significant investment in innovative intellectual property and/or technological developments.

Challenges

Finding **affordable capital** is a challenge for all; one that companies acknowledge as a key factor **limiting** their growth. The declining margins and the difficulty of procuring capital restricts investment in infrastructure, growth and consolidation.

The industry is becoming increasingly global and companies are concerned about maintaining their competitive advantage in the Canadian and global markets. In fact, **competition from international companies** for service work was identified by companies as the factor most limiting their growth.

The **OCASE** tax credit can be crucial for a company's success. Companies use OCASE to compete in a global market with other jurisdictions that provide similar incentives to reduce the effective cost of

labour. Unlike other jurisdictions, OCASE is applied to the vendors (i.e., the animation/VFX company) thereby enabling company reinvestment in crucial areas such as data management, workflow, hardware upgrades, and staff professional development. As such, some stakeholders have been concerned about the perceived **long processing times** and **uncertainty** as to changes that might be made to how the credit is administered. However, Ontario's provincial government stated in November 2018 that "[t]he government is committed to providing stability and support for this key industry, while reviewing all business support programs. Ontario's existing tax credits help ensure the industry continues to contribute to the Ontario economy."[3] As such, some of the concerns relating to stability may be assuaged.

Strategic Outlook

Considering the market realities, opportunities and challenges, companies can adopt some strategies to best position themselves to take advantage of the growing global market for animation and visual effects:

- **Creating a collaboration ethic**: identify collaborative strategies and areas to work together such as wages and talent, bidding for major productions, sharing risk of new IP, aggregating purchasing power for technology, collaborating on R&D in conjunction with vendors, etc.;
- **Investing in IP**: identify opportunities to grow IP either through original content or through technological innovations.

In all, Ontario's computer animation and visual effects industry is a critical component of Ontario's creative economy and is one that has shown a remarkable resilience in face of real challenges.

[3] Fall Statement 2018, Chapter I, Section B: https://www.fin.gov.on.ca/fallstatement/2018/chapter-1b.html

1. Introduction

Building on previous engagements, CASO engaged Nordicity to develop a profile of Ontario's computer animation and VFX industry. This report seeks to describe the current state of the industry in Ontario, and the competitive positioning of the industry in a global marketplace.

This *Profile of Ontario's Computer Animation and VFX Industry* delivers key information about the companies operating in this industry including:

- **An Overview** – e.g., years in operation and types of business ownership;
- **Financial Profile** – e.g., revenue by market and operating expenses, as well as access to financing;
- **Skills and Employment Assessment** – e.g., number of full-time, part-time and freelance employees, availability of required skills; and perceived quality (preparedness) of new hires;
- **Economic Impacts** – e.g., direct, spin-off and total impacts and FTEs; and
- **Industry Positioning** – e.g., areas of opportunity and barriers to growth.

1.1 Approach and Methodology

At the start of the project, Nordicity created a data plan that guided the secondary research, interviews and the survey. This plan was divided into five themes – Industry Benchmarks, Skills and Employment, Business Models, Technological Advancement and Public Support – and detailed all data points and where the data would be sourced from. These sources are elaborated upon in the following sub-sections.

1.1.1 Secondary Research

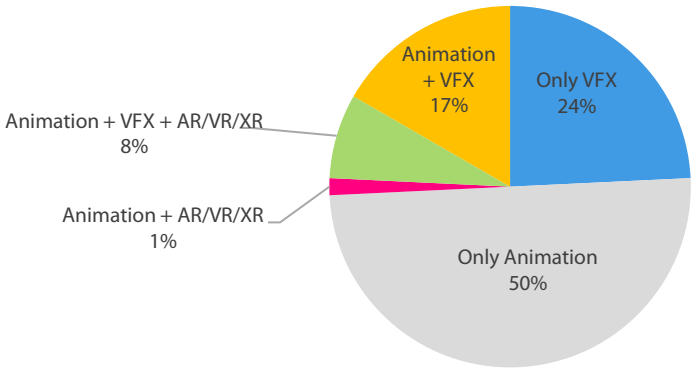
Nordicity researched topics described in the data plan that included new types of animation, level of employment, animation and VFX programs at Ontario's post-secondary institutions, changes in workflow, among others. We sourced information from industry association websites, animation and VFX blogs, financial news websites, and film and television news websites such as Box Office Mojo, Animation Boss and Hollywood Reporter, among others.

1.1.2 Online Survey

The primary research tool for this study was a detailed online survey distributed to computer animation and VFX companies based in Ontario including both foreign-owned and Canadian-owned companies. The survey provided the quantitative inputs Nordicity required, to build the profile and calculate the economic impact of the industry. Nordicity worked extensively with CASO to build a distribution list of 71 companies, which included both CASO members and non-members, and served as the "survey universe."

Of those 71 companies, 16 only provides VFX services, while 31 were solely focused on computer animation. Notably, not all companies fell squarely into the VFX or computer animation category. Indeed, the universe consisted of 14 companies that work in *both* computer animation and VFX, and five that work in animation, VFX and AR/VR/XR. The final 10 companies in the universe represented incorporated individuals and specialized suppliers to the computer animation and VFX industry. The figure below provides a complete breakdown of the universe. Technology companies and post-secondary institutions were not considered for this study.

Figure 1: Breakdown of Ontario's Computer Animation and VFX companies



n = 71

The survey was distributed using the online survey tool. Nordicity and CASO also called each company individually in order to promote the survey and study. The participation rate for CASO members was much higher than non-members. 67% of CASO members on the distribution list completed the survey, while 27% of non-members on the distribution list completed the survey. In aggregate, the **total response rate was 46%**, based on 33 usable responses.

We used this methodology to calculate gross revenue, expenditure and production output:

- We calculated an average from survey responses that excluded large companies (outliers);
- The average was multiplied by the number of companies in the universe, less the number of outliers; and
- Finally, the product calculated above was added to the combined revenue/expenditure/output of the outlier companies.

Industry operating margin was calculated as the difference between gross revenue and expenditure.

1.1.3 Interviews

Nordicity conducted interviews to gather qualitative information about Ontario's computer animation and VFX companies that may not have been captured in the survey or through secondary research. Interviews provide context for the survey data, and examples of innovations and business strategies.

Nordicity created an interview questionnaire containing questions about strategy, technological advancement, the labour market, business models, and related topics. Nordicity conducted 13 one-hour interviews with a mix of computer animation and VFX companies, and service and content owning studios as well as faculty members from Ontario post-secondary institutes. The interviews were conducted by phone and in person where possible.

1.1.4 Economic Impact Assessment

In preparing the economic impact estimates, Nordicity used its MyEIA model, which employs Statistics Canada Input-Output tables to compute economic impacts. The inputs for the model are primarily gross revenue for the industry, gross margin, average FTE salary, average contractor wages and gross expenditures, as gathered by the survey (see Section 1.1.2).

The model requires the expenditure to be allocated to different categories. Labour expenditure was derived from the section of the survey which asked for percentage of expenditure allocated to labour (employee wages + contract labour). Expenditures for other categories were calculated based on the expenditure profile from the 2014 report.

Average FTE salary was calculated by dividing the employee wages and benefits portion of gross labour expenditure by gross number of full-time employees (average FTE * gross number of companies). Average contract wages were calculated by dividing the contract labour portion of gross labour expenditure by gross number of contract and freelance employees (average number of contractors and freelancers * gross number of companies).

The contribution of the industry to the provincial economy can be articulated in two ways:

- The **direct** economic impact refers to the income, GDP and jobs generated in the course of the industry's day-to-day operations. This economic impact is largely in the form of wages and salaries paid to employees and contract workers.
- The **spin-off** economic impact includes both indirect and induced impacts:
    - The indirect economic impact refers to the increase in economic activity that occurs when companies purchases goods and services from its suppliers. These purchases increase income and employment at the supplier companies and, in turn, increase demand for other upstream suppliers – i.e., the suppliers' suppliers.; and
    - The induced economic impact refers to the increase in household income, GDP and jobs that can be attributed to the re-spending of income by households that earned income at both the direct and indirect stages described above.

1.2 About this Report

The remainder of this report follows the following structure:

2. **Global Market and Industry** describes the industry workflows and business models, current global market conditions including notable trends;
3. **Ontario's Computer Animation and VFX Industry: Industry Profile** describes the companies in the industry, recent developments, and how companies have responded, tax credits, and competition with global and Canadian studios;
4. **Ontario's Computer Animation and VFX Industry: Financial and Economic Overview** provides financial information and economic impacts;
5. **Ontario's Computer Animation and VFX Industry: Employment and Skills Education** provides a skills and employment analysis, and employment impact of the industry;
6. **Strategic Outlook for Ontario's Computer Animation and VFX Industry** contains a discussion of challenges faced by the industry, and opportunities for bettering the industry's positioning.

2. Global Market and Industry

Globally, the computer animation and VFX industry presents significant opportunities thanks to the growing interest in animation and the increasing demand for VFX. Accordingly, to be able to understand the opportunities for Ontario's computer animation and VFX companies, one must first understand the business of animation and VFX in Ontario. This section first defines the industry in terms of products and services, workflows and business models after which it describes global developments relevant to companies in Ontario.

2.1 About the Computer Animation and VFX Industry

In general, computer animation and VFX companies in Ontario produce content and/or provide other services for film, television and digital media markets, in Canada and internationally, regardless of where the live action production took place. Animation studios create 2D and 3D animation for feature films, TV series, YouTube and other digital platforms, commercials, etc. VFX studios create VFX for feature films, TV series, and commercials to an extent. There are some studios that work in both lines of business, in addition to production, AR/VR/XR and other related areas.

Companies in the industry work primarily on fee-for-service contracts, although some do own the content they produce. Their customers range from traditional film and TV producers and broadcasters to SVOD services such as Netflix and Amazon. Some studios also work on projects for advertising agencies.

The industry relies on creative and technical talent, and a range of sophisticated software and hardware to create high-quality animated content and sophisticated VFX. Technology is critical in the day-to-day operations of these companies, and they keep a close eye on developments in the area.

These Ontario companies have won awards such as the Canadian Screen Awards, Academy Awards, Emmy Awards, Pixie Awards, VFX Society Awards among many others.

2.1.1 Workflow

A typical animation production workflow has three stages – pre-production, production and post-production. Some service studios likely work on only one or two of these stages, for example, only on post-production.

While the workflow for VFX studios has the same main stages, they work within the workflow of a traditional feature film or TV production. Their involvement is comparatively light in the pre-production stage compared to the post-production stage which is when they do majority of their work. The figures below depict the workflow of a typical 3D feature film, and the workflow of a typical VFX feature.

Figure 2: Typical 3D Feature workflow

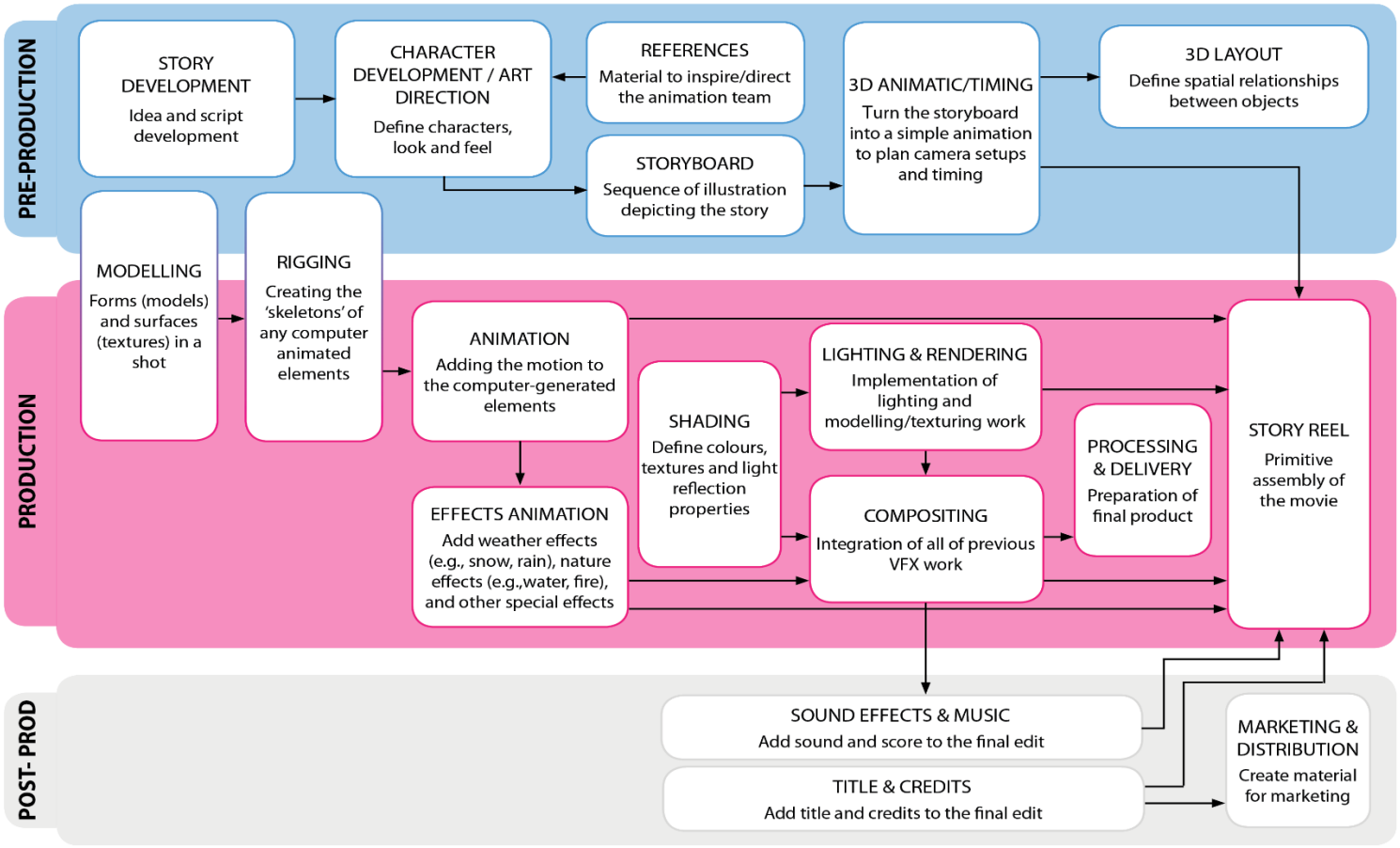
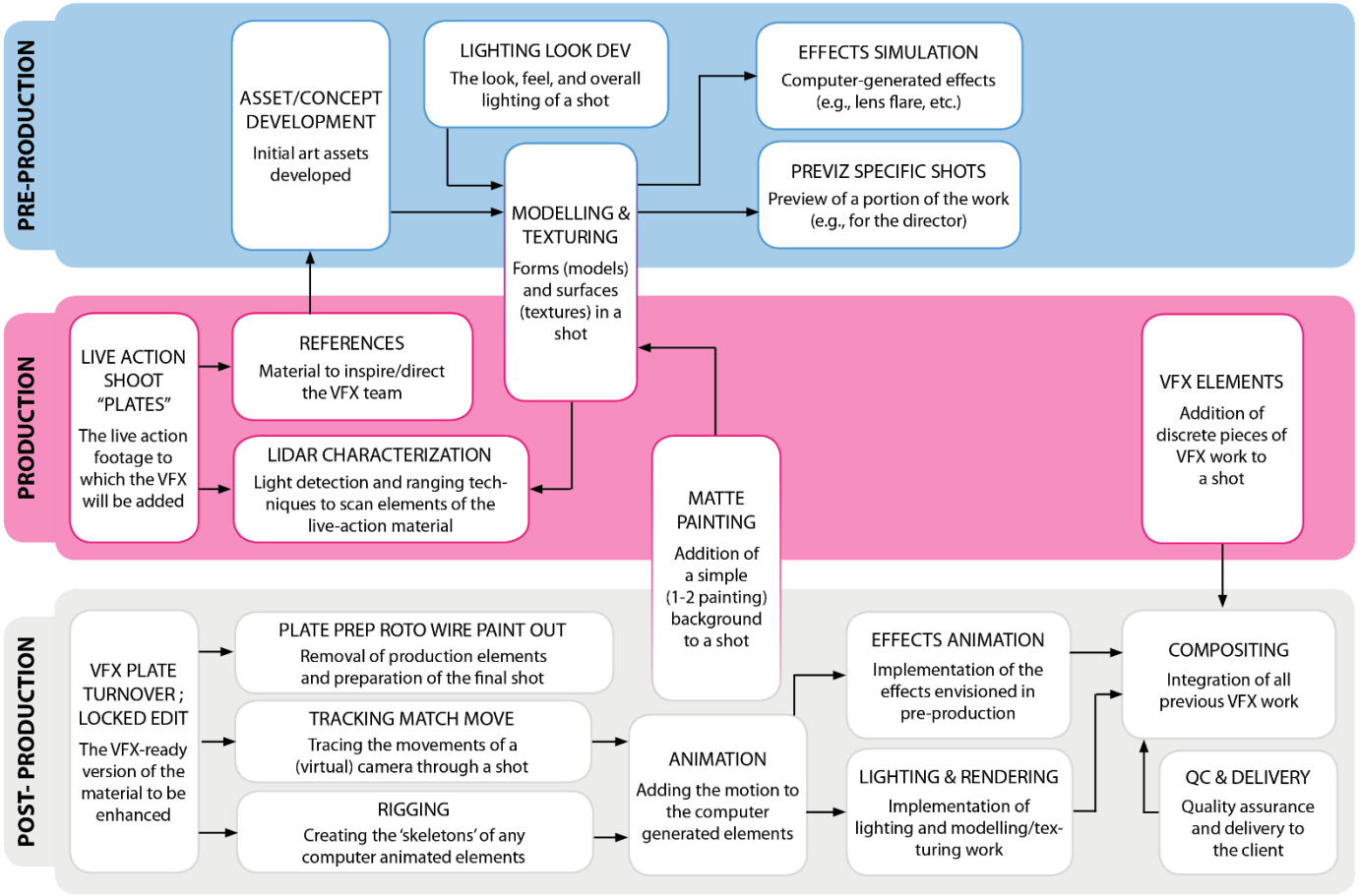


Figure 3: Typical VFX Feature workflow



Pipeline

For 3D modeling, Maya remains one of the best tools available with some Ontario companies building their entire pipeline around it.[4] SideFX Houdini has become a go-to tool for VFX and is used by industry behemoths like Pixar and Sony Pictures Imageworks,[5] and interviews suggest that it is also widely used in Ontario. As ever with 3D modelling, rendering is the biggest source of cost and time overruns on budgets for these companies. Companies are likely to have render farms on-site and personnel to manage them.

For managing workflows and collaboration, interviewees report using Shotgun as well as Slack and Google Docs.

2.1.2 Business Models

In general, there are two business models at play in the computer animation and visual effects industry:

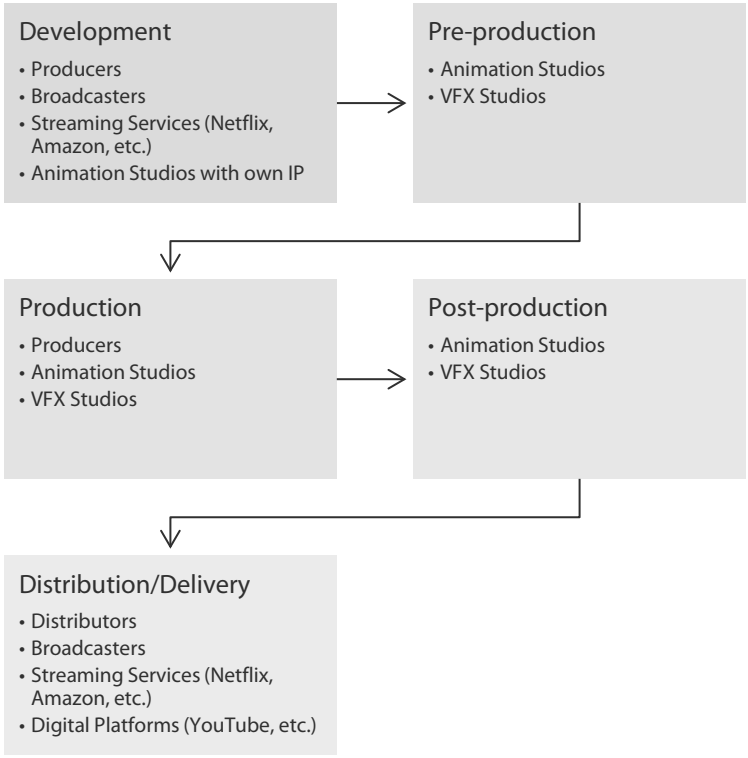
- *Fee-for-Service:* where companies work on a component of a larger property with the underlying intellectual property (IP) continuing to be owned by the original rightsholder. In this context, the animation or VFX company typically does not receive downstream revenue; and
- *IP-Ownership:* where companies own and exploit the IP rights to all or part of a property. Such ownership can result in unit sales and other downstream revenue (e.g., royalties, license payments, etc.).

Animation studios in Ontario work on fee-for-service contracts for domestic and international clients, develop their own properties, or use some combination of the two models. On the other hand, most VFX companies work for domestic and international clients primarily on a fee-for-service basis (on projects where the intellectual property is owned by another company). That said, some VFX companies also develop their own IP relating to innovations in technology and digital assets that have commercialization potential and offer a creative output differentiation in this competitive market.

[4] Source: Interviews conducted as part of the 2018 Study of Ontario's Computer Animation and VFX Industry

[5] The Globe and Mail, At SideFX, 'we know that we'll be in every movie up for the visual-effect award at the Oscars', February 2, 2018. https://www.theglobeandmail.com/arts/film/at-sidefx-we-know-that-well-be-in-every-movie-up-for-the-visual-effect-award-at-theoscars/article37796101/

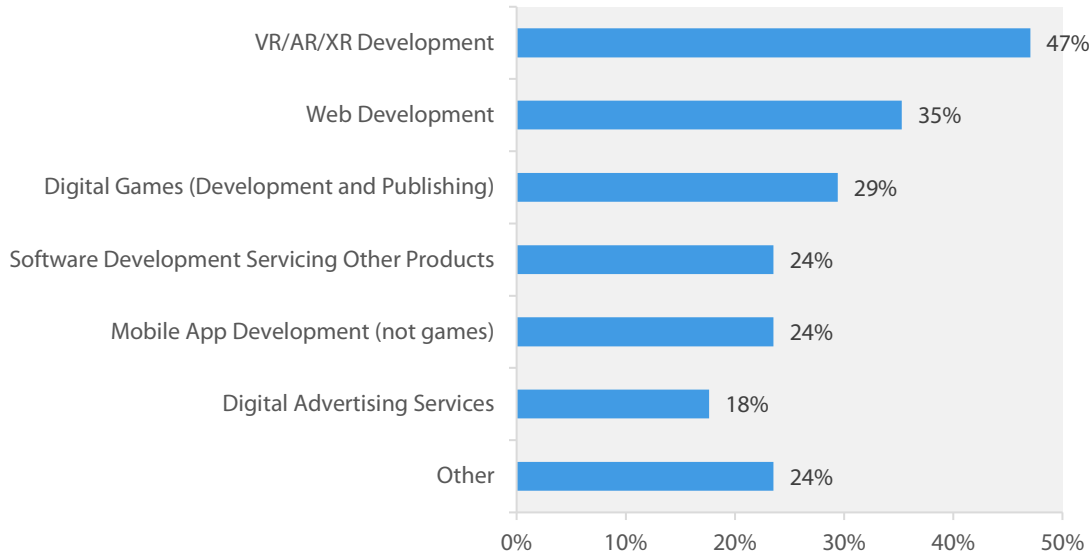
Figure 4: Production stages and the relevant entities at each stage



Adapted from Future Learn - *The seven stages of film production*

In addition to their primary lines of business some companies are piloting new product lines, as seen in the figure below. Almost half (47%) of those companies reported AR/VR/XR development as a new product line they have started in the last three years.

Figure 5: New product lines started by Ontario's Computer Animation and VFX companies



n = 17
Source: Survey of Ontario's Computer Animation and VFX Industry 2018

2.2 Global, Mainstream Environment

The computer animation and VFX industry operates in an **increasingly global environment**. Blockbuster productions continuously push the envelope of realism and technical possibilities by involving studios all around the world. It is rare for a studio to assume the entirety of a blockbuster VFX. For instance, Marvel Studios' *Infinity War* involved 13 VFX companies on four continents to produce the outstanding number of 2,680 VFX shots.[6] Studios in different time zones can ensure that progress is made at every moment of the post-production process.

Computer animation and VFX have taken an increasing role in the way global audiences approach a movie. VFX are more and more common, and less and less perceptible. As the technical bar is raised higher by studios, audiences' expectations are raised even higher. If we look at the 2017 worldwide box office, 12 of the top 100 grossing movies are computer animated features (e.g., *Despicable Me 3, Coco, The Boss Baby, Cars* 3) and nearly all the other movies are action-based, CGI-intensive blockbusters (e.g., *Star Wars: The Last Jedi, The Fate of the Furious, Jumanji: Welcome to the Jungle, Spider-Man: Homecoming*).[7] Computer-generated images have become a **key component of escapism** for audiences. Studios do not mind spending **increasing amounts on VFX** to make sure they offer this thrill to audiences. In that respect, the global animation industry represented US$254 billion in 2017 and could reach **US$270 billion in 2020**.[8]

This rise in spending is reflected by the **increasing budgets of blockbusters**. Of the top 50 highest budget movies ever made, 19 were produced in the past five years.[9] With VFX accounting for about 30 percent of a film's production budget, these high figures foreshadow bright perspectives for the global CGI/VFX industry.

Opportunities lie not only in the feature film world but also in television. A prominent example of a high-budget TV series is HBO's *Game of Thrones* which began production with a comparatively modest budget of $5 million per episode and by its eighth season (filmed in 2018), grew to a budget of $15 million per episode.[10] Another VFX-heavy HBO series *Westworld* has a budget of $10 million per episode.[11] While high-end TV budgets are rising, traditional TV networks are not spending as much as the SVODs.

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[6] *Avengers: Infinity War VFX Breakdown*, August 14, 2018. http://www.animationboss.net/avengers-infinity-war-vfx/

[7] BoxOffice Mojo, 2017 Worldwide Grosses, https://www.boxofficemojo.com/yearly/chart/?view2=worldwide&yr=2017

[8] Markets Insider, Global Animation, VFX & Games Industry report 2018-2020, May 1, 2018, https://markets.businessinsider.com/news/stocks/global-animation-vfx-games-industry-report-2018-2020-1022993410

[9] Movie budgets, The Numbers, https://www.the-numbers.com/movie/budgets/all

[10] LRM, We Are Entering The Golden Age Of Fantasy On TV, October 10, 2018, https://lrmonline.com/news/we-are-entering-the-golden-age-of-fantasy-on-tv

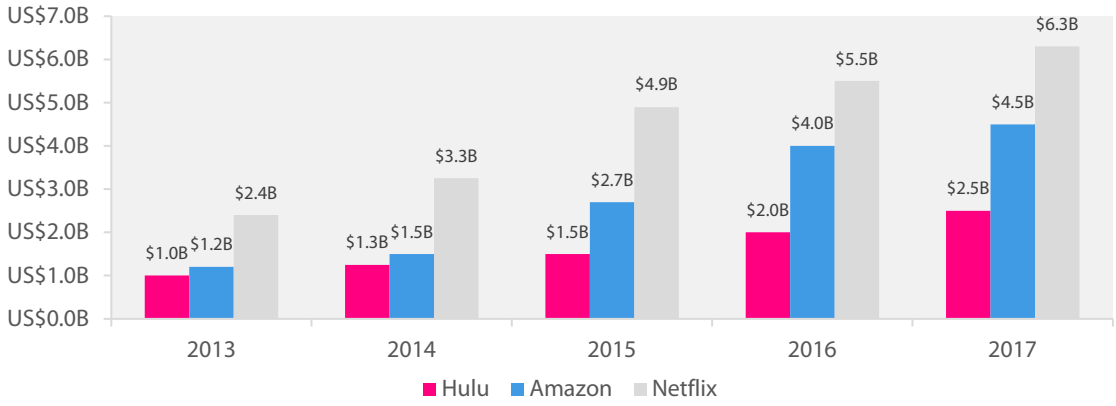
[11] Variety, TV Series Budgets Hit the Breaking Point as Costs Skyrocket in Peak TV Era, September 26, 2017, https://variety.com/2017/tv/news/tv-series-budgets-costs-rising-peak-tv-1202570158/

2.3 SVOD Services Driving Global Demand

Subscription-video-on-demand (SVOD) services such as Netflix, Amazon Prime Video or Hulu also play an important part in the changing global environment. Not only they have participated in the changes in audience consumption habits, but they also have **emerged as producers and distributors of original content**.

Indeed, since 2013, SVOD platforms have spent substantial sums to secure exclusive distribution rights or to develop new original shows. Netflix, building on the success of its original series like *Stranger Things* or *Orange is the New Black*, had an estimated budget of US$7.5-8 billion for content in 2018.[12] Amazon (*The Man in the High Castle*, *Transparent*) is reported to have spent US$4.5 billion on content last year and Hulu (*11.22.63, The Handmaid's Tale)* followed with about US$2.5 billion.[13] SVOD services' ambitious series and features, ranging from sci-fi to period epic, to animated sitcoms, continue to fuel the demand for VFX and animation. Their original programming rivals the finest theatrical productions and captivates audiences all around the world.

Figure 6: SVOD spending on content in US$



Sources: Netflix, Hulu, Amazon

In 2017, animation content on streaming platforms represented US$2.4 billion.[14] Anecdotal evidences underlines how **SVOD services are increasingly putting the emphasis on animated children's programming**:

- In 2014, Netflix signed a deal with DreamWorks Animation to develop several series based on DreamWorks franchises. Since then, 14 shows have debuted on the SVOD platform, including *How to Train your Dragon, Trollhunters, Madagascar* and *The Boss Baby*. This deal was

[12] Moffett Nathanson, Wall Street Journal, as reported by Recode - Netflix spends more on content than anyone else on the internet — and many TV networks, too, https://www.recode.net/2018/2/26/17053936/how-much-netflix-billion-original-content-programs-TV-movies-hulu-disney-chart

[13] Moffett Nathanson, Wall Street Journal, as reported by Recode - Netflix spends more on content than anyone else on the internet — and many TV networks, too, https://www.recode.net/2018/2/26/17053936/how-much-netflix-billion-original-content-programs-TV-movies-hulu-disney-chart

[14] Markets Insider, Global Animation, VFX & Games Industry report 2018-2020, May 1, 2018. https://markets.businessinsider.com/news/stocks/global-animation-vfx-games-industry-report-2018-2020-1022993410

expanded in spring 2017: Netflix will produce animated series based on Comcast-NBC Universal properties (e.g., *Fast & Furious*);[15]

- Netflix spent $30 million to acquire the worldwide rights (outside China) of *Next Gen*, a computer animated film based on the online comic *7723* by Wang Nima. The film was produced in Canada by Tangent Animation;[16]
- Amazon's *Lost in Oz* won three Emmy awards, underpinning the intention of the internet giant to explore animated children's content; and
- Disney will launch its own streaming service in 2019. This platform is expected to become a strong competitor, compiling existing titles from beloved franchises (Pixar, Star Wars, Marvel). Disney has also announced that it will bolster its offer with original series and film.[17]

These examples of **content targeting younger audiences** should not diminish the role of **animated series for adults**, a niche well exploited by SVOD and cable players.

2.4 Resurgence of Animation for Adults

In fact, Netflix animated series targeting young adults have received critical and public acclaim: *BoJack Horseman, Big Mouth* or more recently Matt Groening's *Disenchantment*, prove that animation is accessible to a wider audience. Even though these examples are traditionally animated series, they are evidence of a renewed interest for animation for adults globally.

The successes of Adult Swim's *Rick and Morty*, FXX's *Archer,* or the animated *Corner Gas* series indicate new opportunities for animation for adults, and promising growth opportunities for the industry. Studios and broadcasters are less hesitant to invest on adult animation. Creators are also getting interested in this medium that offers more freedom. This "new golden age of animation" explores existential themes, political issues and provocative comedy.[18] In 2016, *Sausage Party*, a computer animated film written by Canadian talents Seth Rogen and Evan Goldberg, has thus become the most commercially successful R-rated animated film, grossing more than US$140 million worldwide.[19]

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[15] Variety, Fast and Furious animated series from DreamWorks Animation set at Netflix, April 23, 2018. https://variety.com/2018/TV/news/fast-furious-animated-series-netflix-1202782071/

[16] Deadline, Netflix makes $30M worldwide rights deal for animated 'Next Gen', May 11, 2018. https://deadline.com/2018/05/next-gen-netflix-30-million-worldwide-rights-deal-animated-film-cannes-1202388223/

[17] The Verge, Disney's streaming service: all the news and updates, August 5, 2018. https://www.theverge.com/2018/8/5/17649060/disney-streaming-service-updates-marvel-star-wars-shows

[18] The Guardian, In the golden age of TV, the existential-animation is king, September 11, 2017. https://www.theguardian.com/TV-and-radio/2017/sep/11/bojackhorseman-netflix-animation-depression

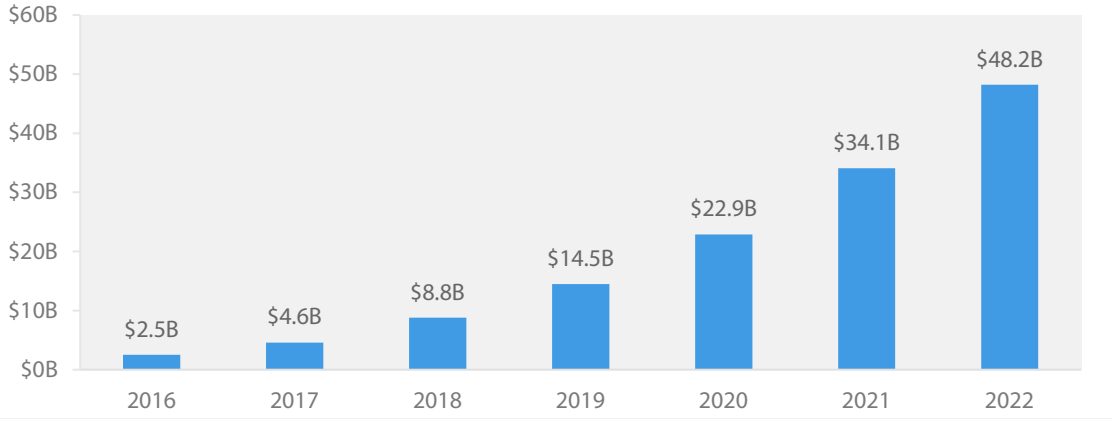
[19] BoxOffice Mojo – https://www.boxofficemojo.com/movies/?id=sausageparty.htm

2.5 VR/AR/XR

The future of computer animation and VFX lies also in **the democratization of virtual reality, augmented reality and mixed reality** (VR/AR/XR). Whether they are interactive applications, animated shorts or artistic experiences, VR/AR/XR projects involve intensive computer processing and visualization. Consuming VR content has become a more comfortable experience that attracts a growing number of users. The introduction of standalone head mounted displays (HMD), such as the Oculus Go or the HTC Vive Focus is forecast to boost adoption. Global unit sales of virtual reality HMDs are projected to reach 156 million, from 40 million in 2018.[20]

VR and AR are being deployed everywhere: in phones (mobile-based headsets, AR applications on smartphones), for gaming (2 million Playstation VR sold as of December 2017) or in dedicated locations (VR arcades). Location-based entertainment is becoming one of the fastest growing sectors of the VR industry, illustrating the increasing interest for VR content. More broadly, immersive entertainment is expected to become a global trend with venues especially designed for the presentation of digital media works. The two Madison Square Garden Spheres, planned to open in Las Vegas and London in the coming years, are arenas designed to push the boundaries of multi-sensory performances, with 360-degree screen, haptic flooring system and augmented reality projections.[21]

Figure 7: Total global VR industry revenues, 2016 - 2022



Source: Greenlight Insights – 2018 VR Industry Report, Spring Edition

With the VR industry projected to reach almost US$50 billion in global revenues by 2022 (from US$9 billion in 2018),[22] more and more computer animation and VFX studios are embracing this new way to tell stories.

Many global studios have opened their own immersive entertainment department, like Industrial Light and Magic's xLAB, Framestore VR Studio or Method EXP. VR has grown to be recognized as a medium of its own. More than simple attractions, VR works are showcased and recognized in major film festivals and ceremonies. For instance, for its 2018 edition, the Cannes Film Market dedicated 16,000 square feet to VR and new medias. In 2017, Alejandro G. Inarritu's VR installation *Carne y Arena*,

[20] Greenlight Insights, 2018 VR Industry Report, Spring Edition

[21] Variety, MSG Sphere unveiled with state-of-the-art venues set for Las Vegas and London, April 26, 2018. https://variety.com/2018/music/news/msg-sphere-dolan-azoff-venue-arena-las-vegas-london-1202789482/

[22] Greenlight Insights, 2018 VR Industry Report, Spring Edition

financed by Legendary Entertainment, was awarded a special Academy award for opening "new doors of cinematic perception."[23]

Virtual Reality, Augmented Reality and Mixed Reality are at an early stage but show promising results. These technologies would still remain science fiction fantasies without computer modeling techniques or real-time rendering. Computer animation and VFX will accompany and support the growth of these still experimental technologies and VR/AR/XR will push developers and creators to design ground-breaking software and never seen before worlds.

As described in this section, here are the key developments relevant to companies in Ontario:

- Producers and studios continue to spend huge amounts on VFX
- The global animation industry represented US$254 billion in 2017 and could reach US$270 billion in 2020
- Subscription-video-on-demand (SVOD) services are helping to drive demand for animation and VFX
- There is growing demand for animated content for adults, as demonstrated by the success of Adult Swim's *Rick and Morty*, FXX's *Archer* and others
- New avenues for storytelling have emerged in the form of VR/AR/XR

[23] Variety, Oscars: Alejandro Inarritu's VR installation to receive special award, October 27, 2017. https://variety.com/2017/film/awards/oscars-alejandro-g-inarritus-virtual-reality-installation-carne-y-arena-to-receive-special-award-1202601265/

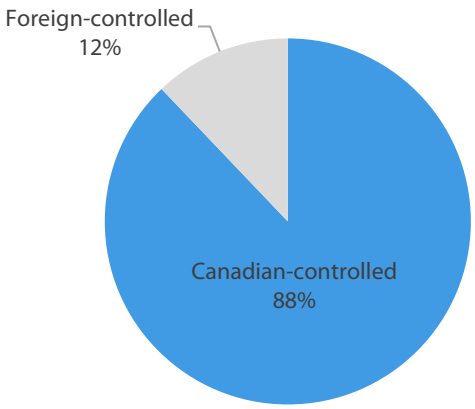
3. Ontario's Computer Animation and VFX Industry: Profile

Within the context of global opportunities, there are competitive pressures facing Ontario's computer animation and VFX industry, originating from other Canadian jurisdictions as well as internationally. To understand how companies are responding to these pressures, we first describe the companies that constitute this industry in Ontario. It is important to note that these companies are not static in times of marketplace and technological changes – but rather are constantly pivoting to remain competitive. A contributor to this industry's competitiveness is the Ontario Computer Animation and Special Effects (OCASE). This tax credit is unique in that it is a corporate labour tax credit that is filed annually by the animation and VFX companies, where as most other tax credits are filed for each project by the project's producer. By enabling the animation and VFX companies to capture the value of the credit, OCASE helps Ontario companies to invest in their creative output, staff training, data management, and workflow and hardware upgrades.

3.1 About Ontario's Computer Animation and VFX Companies

To get a better sense of how an industry operates, it can be instructive to learn more about the ownership, age, and business lines of its constituent companies. To that end, Ontario-based computer animation and VFX companies are predominantly Canadian-owned (88%).

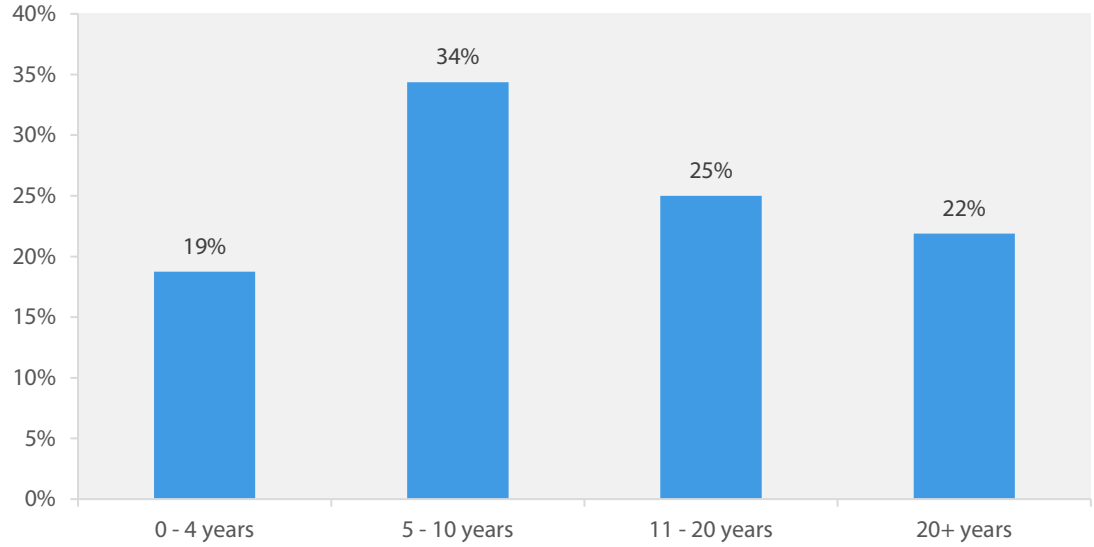
Figure 8: Canadian vs foreign-controlled Computer Animation and VFX companies in Ontario



n = 33
Source: Survey of Ontario's Computer Animation and VFX Industry 2018

In terms of age, companies have been in operation for an average of 11.5 years. That said, more than half (53%) of the companies have been in operation for ten years or less, with 19% being in operation for under five years. Evidently the industry presents an opportunity for start-ups, and has a balanced mix of established and new companies.

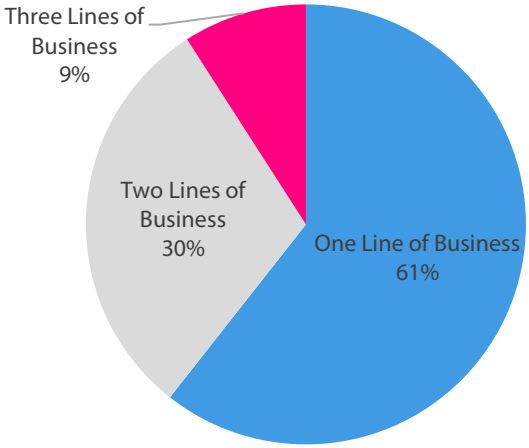
Figure 9: Number of years of operation of Ontario's Computer Animation and VFX companies



n = 32
Source: Survey of Ontario's Computer Animation and VFX Industry 2018

There appears to be an industry-wide trend of specializing with a majority of the companies (61%) operating a single line of business. Almost one-third (30%) of the companies indicated having two lines of business; and 9% indicated having three lines of business.

Figure 10: Number of lines of business operated by Ontario's Computer Animation and VFX companies

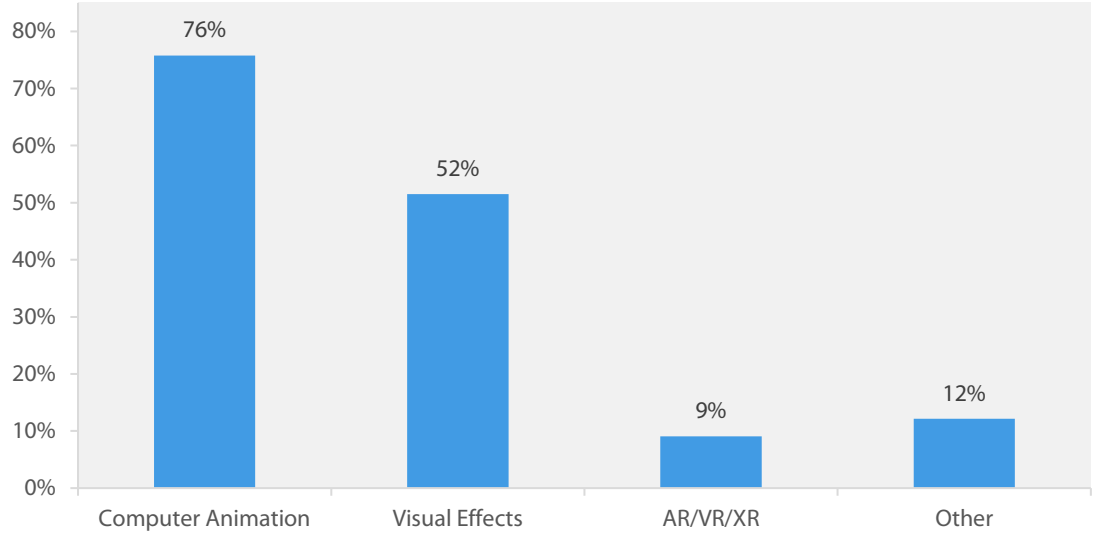


n = 33
Source: Survey of Ontario's Computer Animation and VFX Industry 2018

This finding likely indicates that companies are trying to create a niche and focus on one or two business areas, instead of competing in multiple arenas. Examples include a firm that consciously seeks out small projects in the non-profit sector and another firm that underwent a visioning exercise to discover their core competency and ended up divesting from all other lines of business.

An emerging area of interest for computer animation and VFX companies is augmented/virtual/extended reality with 9% of the respondents reporting it as a line of business, as seen in the figure below. "Other" lines of business include production and IP creation. Clearly, technology is enabling companies to find new avenues for growth.

Figure 11: Lines of business of Ontario's Computer Animation and VFX companies



n = 33
Source: Survey of Ontario's Computer Animation and VFX Industry 2018

3.2 Recent Developments

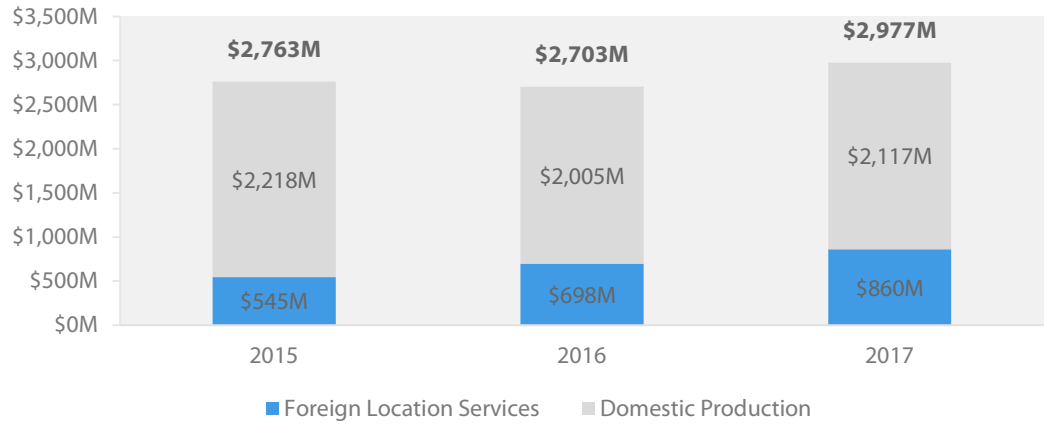
This section reviews some recent developments that directly affect the business environment for the computer animation and VFX companies in Ontario, and how companies have responded to these changes.

3.2.1 Marketplace Evolution

The film and TV production sector has evolved substantially since 2014. As documented in the latest annual film/TV *Profile,* Ontario has benefited greatly by the uptick in production volume; foreign location service production (FLS) in Ontario increased by 23.2% year-over-year to $860 million in fiscal 2017.[24] Much of the production expansion in Ontario seems to be driven by the major US streaming services, like Netflix, Amazon and Hulu.

[24] Nordicity estimates based on data collected from CAVCO

Figure 12: Total Film/TV production volume in Ontario



Source: Nordicity estimates based on data collected from CAVCO

In a deal made with the federal government in 2017, Netflix committed to spending $100 million annually on Canadian content for five years.[25] Indeed, more series and films shot in Toronto are expected to be seen on Netflix in the coming year: *Northern Rescue, Sunny Jim, In the Tall Grass* and *Umbrella Academy*.

Interviewees report that streaming services are more demanding than traditional producers, and that there is a pressure to decrease prices. Since visual effects are typically a back-end process in a production, it is likely that the budget-harried producer leans on the effects suppliers as a cost make-up just to finish the project.

On the traditional feature film side, the market has not changed as much, and there continues to be a major market for VFX for large features. However, Ontario does not have representation of the world's major VFX studios – unlike Montreal, which has Cinesite, ON Entertainment, and Framestore, and Vancouver, which has Lucas' ILM and Cinesite (which bought Nitrogen Studios in Vancouver). Without the big studio presence, studios in Ontario the industry is somewhat less well positioned to secure these large film projects. That said, increased collaboration between Ontario-based studios may help to better enable Ontario to work on projects of this scale.

3.2.2 Technology Evolution

Technology obviously plays a major role in the creation of animated content and VFX both of which are highly computing intensive. Developments in technology can create opportunities for companies to try new product lines or simply to improve throughput and efficiency. This section describes some recent developments in technology that have had a positive impact on the industry.

[25] Netflix to spend $500 million to produce Canadian content, September 27, 2017. https://www.thestar.com/entertainment/2017/09/27/netflix-commits-to-spending-500m-on-producing-canadian-content-reports.html

SIRTnet

Launched in 2017, SIRTnet was developed by Sheridan College's Screen Industries Research and Training Centre (SIRT) in partnership with leading IT companies and screen industry partners, with the "sole purpose of becoming a remote collaboration platform for end-to-end digital production and postproduction within the screen industries".

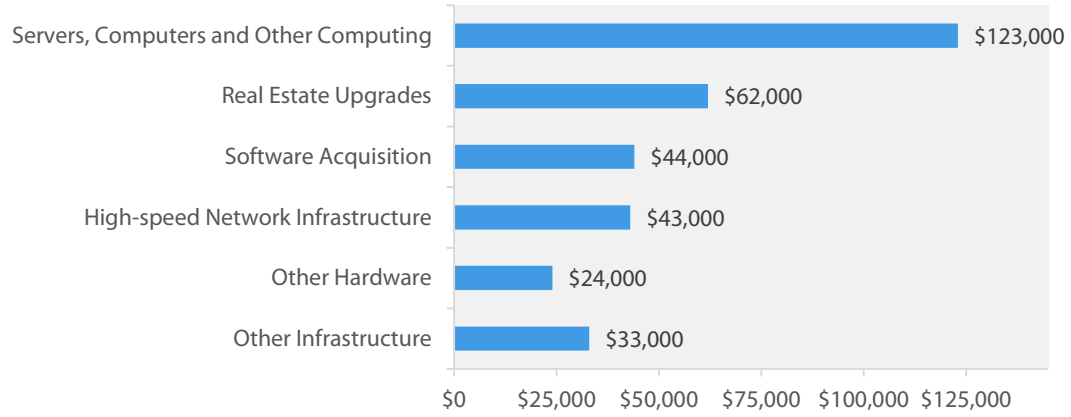
The idea for SIRTnet emerged from a strategic study commissioned by CASO in which the need for Ontario studios to work together in a secure and private broadband fibre network or "virtual cooperative" was identified. SIRTnet's vision is one of "Co-opetition"; in which the Greater Toronto Area can attract tentpole productions based on the industry's ability to collaborate and work on large projects.

Industry stakeholders see the need to work together and partner with SIRTnet to improve capabilities, to compete with other jurisdictions such as Vancouver and Montreal.

First, **GPU-accelerated rendering** solutions like Redshift and Octane can drastically **reduce rendering time**, allowing faster iterations. Interviewees using Redshift reported multiple benefits: increased throughput, reduced need to outsource rendering, and reduced spending on render farms [26] and related software.

Second, the availability of **pay-on-demand** cloud services has allowed companies to reduce capital expenditure on computing infrastructure like render farms and software licences. As seen in the figure below, servers, computers and other computing infrastructure was the biggest category of new technology investment for the companies Nordicity surveyed.

Figure 13: Average technology investment made by Ontario's Computer Animation and VFX companies



n = 23
Source: Survey of Ontario's Computer Animation and VFX Industry 2018

Interviews indicate that studios are forced to take on lease contracts fir equipment that last anywhere between seven to ten years for productions that last less than two years, thus assuming a huge

[26] A render farm is a collection of computers used by computer animation and VFX studios specifically for rendering.

financial risk. But with pay-on-demand services, companies can scale rendering capacity up and down as needed and rent software licences for the duration of a project, without investing in expensive infrastructure or taking on long-term lease contracts. The availability of dependable local fibre internet providers has accelerated this transition to hosted services.

Finally, **software from the video game development industry** like Unity and Unreal provide real-time rendering capabilities which could radically alter production workflows by reducing production time, and enabling faster (real-time) iteration and revision processes. While not completely switching to real-time engines, companies are experimenting with these tools and trying to find a place for them in their current pipelines.[27]

3.2.3 The Pivot of Canadian Studios

In the environment of changes in the marketplace and in technology described previously, Ontario's computer animation and VFX companies have pivoted and responded in several ways – some have taken advantage of added flexibility, lower cost of outsourcing, and opportunities for shifting into new markets. In fact, many Canadian studios have proved their resilience by evolving their business models in different ways, as the following examples illustrate:

- **Niche markets enabled by technology** – some studios have shifted to certain market segments, like high-end 3D animation, and VR/AR;
- **Niche market segments** – some studios have left computer animation services in general to move more toward the not-for-profit world; or for high-end, non-TV users closer to the major brands (e.g., advertising);
- **Technology enablement** – some studios have taken advantage of production economies of outsourcing through cloud-based services, or are moving to Redshift rendering, or using game development engines to get closer to real-time rendering;
- **New revenue models** – some studios have opted to produce made-for-the-Internet projects and market them as You Tube channels, which shifts their revenue base to revenue share opportunities with YouTube;
- **Search for collaborative producers** – other studios have sought out arrangements whereby they act as executive producers and enter the production process at an earlier stage. In doing so, the service supplier does not bear the brunt of cost-cutting at the final stages, and can work out solutions earlier in the production process; and
- **Genre specialization** – other studios specialize in genre markets, e.g., the kids' genre. This market is doing well, and there is greater demand for a range of technology-based formats, e.g., interactive elements, games, etc.

[27] Source: Interviews conducted as part of the 2018 Study of Ontario's Computer Animation and VFX Industry

The animation/ VFX sector is global and becoming more so as it becomes easier to coordinate work across geographies using high-speed networks, collaboration tools, and cloud services. In addition, the availability of free and easy-to-use software, including Unreal and Unity, has contributed to the democratization of the film-making process. Feature films and audiovisual content in general are now cheaper and easier to produce and distribute. These developments in technology and the associated cost reductions bode well for small-budget and independent projects.

> "We're predominantly 2D for a reason. We stay pretty simple - the beauty of YouTube. We use Flash and Adobe, we don't even use Toon Boom."
>
> - Industry Stakeholder

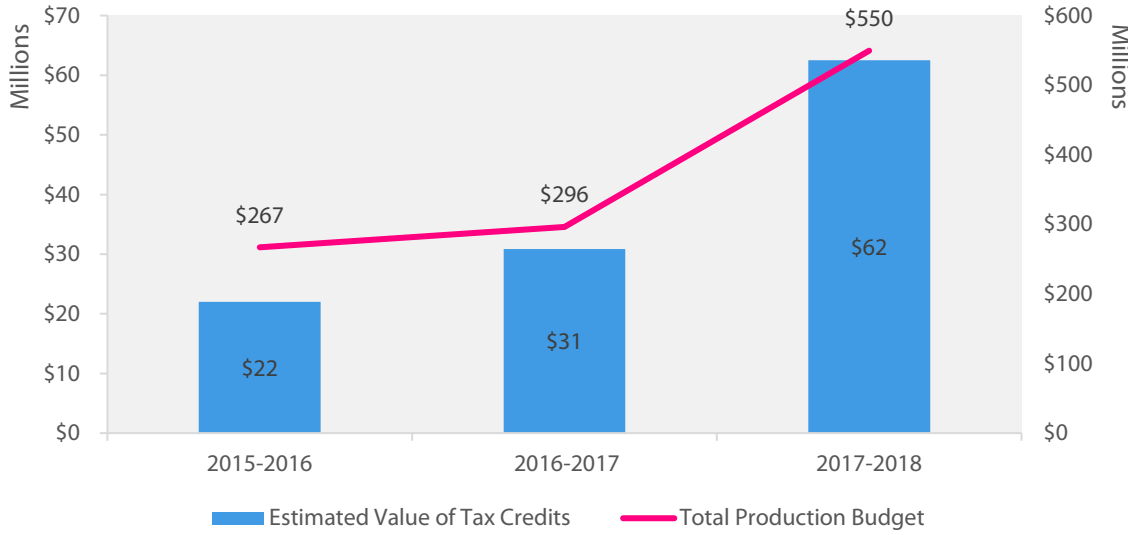
3.3 Tax Credits

In the competitive domestic and international markets for animation and visual effects, the Ontario Computer Animation & Special Effects (OCASE) tax credit helps Ontario-based companies maintain its competitiveness by reducing the effective cost of labour for companies that use it. Moreover, OCASE is a vendor-based tax credit, where the VFX and animation companies benefit directly from the credit – which differs from tax credits in other jurisdictions where producers receive the benefit. As a result, Ontario's animation and VFX companies can use OCASE in a variety of ways including (but not limited to) the following:

- Developing new creative and/or technical intellectual property,
- Building new lines of business,
- Improving data management and/or workflow processes,
- Upgrading software and/or hardware,
- Training staff in the newest software and tools,
- Bidding for larger projects, and
- Invest in their growth.

In 2017-18, Ontario Creates (formerly the Ontario Media Development Corporation) certified approximately **$62 million** in OCASE to support companies, and had a total production value of $550 million, as seen in the figure below.

Figure 14: Total amount of OCASE tax credits disbursed and total production value



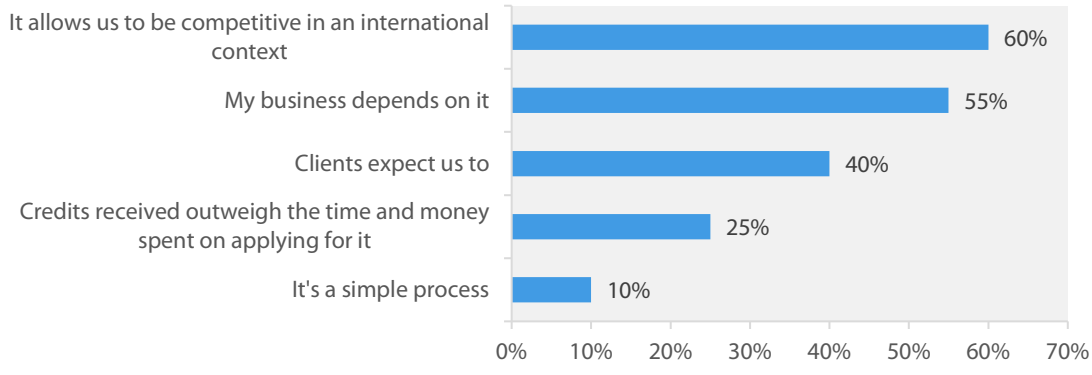
Source: Ontario Creates Tax Credit Statistics

Over the last three years, the value of the projects supported by the certified tax credits has more than doubled, increasing by more than 85% in the last year alone. While the OCASE certifications are a reflection of those projects processed by Ontario in a given year, this growth nonetheless is a clear indicator of significantly increased activity by Ontario-based computer animation and visual effects companies.

Moreover, as OCASE tax credit submissions are issued at the end of a company's fiscal year, there is very likely to be a delay between when the tax credit applications are submitted to Ontario Creates, and when they are processed. As such, a significant portion (if not most) of the $550 million of total production reported in the 2017-2018 year likely relates to production activity undertaken in 2017 (the final reference year of this study).

Beyond being an overall indicator of industry growth, OCASE can nonetheless be crucial for a company's success. As seen in the figure below, companies that apply for OCASE do so to be competitive in an international context (60%), and/or because their business depends on it (55%). Companies that do not apply for OCASE likely perceive themselves to be ineligible.

Figure 15: Reasons why Ontario's Computer Animation and VFX companies apply for OCASE (of those companies that use it)

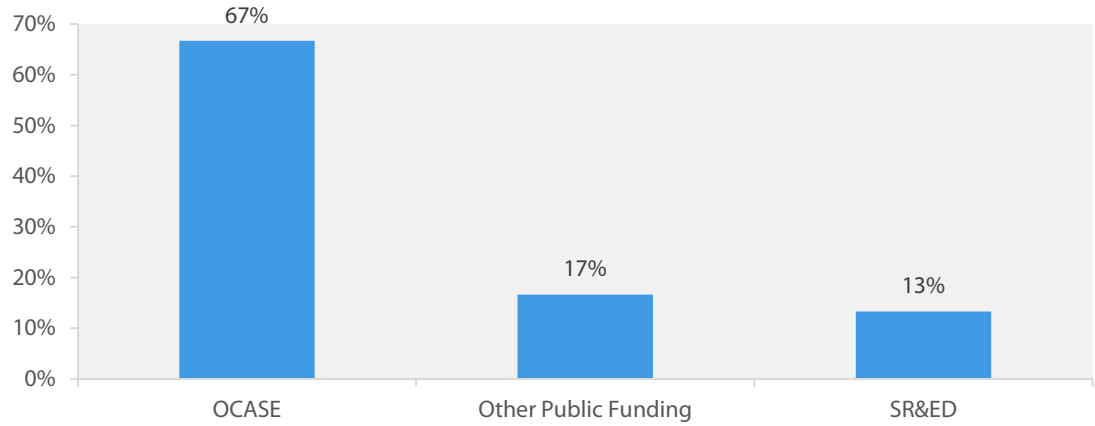


n = 20
Source: Survey of Ontario's Computer Animation and VFX Industry 2018

Interviews indicate that companies often use OCASE as gap financing, and that they are concerned about the high processing times for this corporate tax credit. Some stakeholders reported waiting almost four years to receive credits. However, it should be noted that Ontario Creates has recently implemented some process improvements that may significantly reduce this processing time. When asked why they apply for OCASE, only one-tenth of the respondents indicated they do so because it's a simple process.

Three-quarters (67%) of survey respondents reported receiving OCASE credits and 17% reported receiving funding from other public sources.

Figure 16: Portion of Ontario's Computer Animation and VFX companies receiving funding from public sources



n = 30
Source: Survey of Ontario's Computer Animation and VFX Industry 2018

Respondents reported using other sources of public funding, namely, the Scientific Research and Experimental Development Tax Incentive (SR&ED), the Bell Fund, and Canada Media Fund.

3.4 Competition: International and Domestic

Despite these different opportunities, some yet to unfold**,** the market sees **fierce competition** in the computer animation and VFX industry. There are only a handful of blockbuster productions each year and many majors have their own VFX/computer animation department (e.g., Pixar, Disney Animation and ILM for The Walt Disney Company). Only a portion of the shots will be outsourced, and many studios will compete globally to secure a contract. This situation underlines also the importance of diversification: many studios have developed various areas of expertise, from animation to motion capture, from gaming to VR. This diversification allows such companies to maintain more stable revenue streams, while being able to win a wider variety of contracts. The competition between studios strengthens the bargaining power of clients and tends to drive down margins. Moreover, studios do not only **compete for work but also for talents**. It is not unusual for studios to try to poach talent from other companies with attractive packages. The following list presents some of the major computer animation and VFX studios:

- **United States:** Pixar, Disney Animation, DreamWorks, ILM, Blue Sky, Warner Bros Animation, Sony Pictures Animation, Method Studios, Digital Domain, Lola, Perception, Shade, Zero VFX, CoSA, Pixomondo, Rhythm & Hues, Zoic.
- **United Kingdom:** Framestore, MPC, DNeg, Cinesite, Outpost, Jellyfish Pictures, Union, One of Us, The Mill.
- **France:** Technicolor, Mac Guff, BUF, Solidanim, ZAG, Method Animation, Mikros, Digital District.
- **Germany:** Rise, Scanline, Trixter, Luxx.
- **New Zealand/Australia:** Weta Digital, Animal Logic, Plastic Wax
- **China:** Base FX, vfxNova, Virtuos.

Note that most of the companies cited above have several studios all around the world, including in Canada (e.g., ILM offices in Vancouver, BUF in Montréal). Many companies have subsidiaries in India (MPC, Method Studio, DNeg, Technicolor, Framestore or Digital Domain), or in other East Asia locations (ILM in Singapore).

In addition to the international competition, Ontario companies must stand out from **other studios based in Canada**. Ontario competes principally with Québec (mostly Montréal) and British Columbia (mostly Vancouver). The following lists present some of the studios located in these two cities (asterisk indicates that the studio is the Canadian branch of an international company):

- **Montréal:** Hybride, Rodeo, MELS, Digital Dimension, Scanline*, MPC*, DNeg*, BUF*, Atomic Fiction, Framestore*, Digital District*, Cinesite*, Mikros*
- **Vancouver:** Sony Pictures Imageworks, Image Engine, Thunderbird, Atmosphere, Rainmaker, DHX, Pixomondo*, Digital Domain*, Animal Logic*, Scanline*, MPC*, DNeg*, ILM*, CoSA*, Zoic*

Over the past decade, British Columbia and Québec have built a strong, competitive, high-profile local computer animation and VFX industry.

British Columbia is similar to Ontario in terms of size of the industry (over 60 studios and 10,000+ VFX and computer animation jobs in Vancouver). However, Vancouver is a well-established film production centre (particularly for service production) and this difference in experience can play a

part in producer's choices. With three of the top 10 VFX schools worldwide,[28] Vancouver has established itself as one of the key players of computer animation globally. Indeed, in 2017, total VFX and animation spend in BC reached $900 million, a 30% increase from 2015.[29]

BC's **Digital Animation or Visual Effects** tax credit for digital animation, VFX and post-production activities is currently 16% of labour costs. This tax rate which was reduced to 16% from 17.5% in 2016, is lower than the OCASE rate as well as Quebec's tax credit rates. BC has an additional tax credit for animated productions, applicable to BC labour expenditures incurred in regional (outside metro Vancouver) productions, and distant location (north of Vancouver and other regions of BC) productions.[30]

Québec gathers fewer studios (over 40 studios in Montréal) than BC, but the provincial government has implemented a set of incentives to attract projects and help international companies relocate to the province. These incentives are supported by major investment and have proved to be a success. Indeed, the German studio Scanline opened its Montréal office during summer 2018, as did the U.S. company Double Negative in early 2018. This strategy has gained momentum since 2013 when it was first implemented with international studios like Cinesite, Framestore, and BUF installing branches in Montréal.

Québec offers one of the most advantageous tax credit programs for film and television production in North America. In addition to 20% of all expenditures paid to Québec residents, the tax credit program includes a 16% enhancement for digital special effects, computer animation and filming in front of a chromatic screen. In 2018, the government announced a series of measures aimed at promoting and stimulating the expansion of the digital economy in Québec. The conditions to trigger a tax credit are now more flexible and allow for virtual reality content and multimedia events. The production tax credit has also been expanded to projects made for digital platforms. Consequently, in 2017, VFX and animation spend in Québec amounted $262 million (for 157 projects), up 19% from $216 million in 2015 (103 projects).[31]

The table below shows relevant tax credits available in British Columbia, Québec and Ontario. These credits apply over and above the federal film and television, or production services tax credits.

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[28] The Hollywood Reporter, Top 10 VFX Schools Revealed, August 10, 2018. https://www.hollywoodreporter.com/lists/top-10-visual-effects-schools-revealed-1132771

[29] Vancouver Economic Commission

[30] Canada Revenue Agency

[31] BCTQ, Annual Report 2017-2018

Nordicity

Table 1: Comparison of animation and VFX tax credits in British Columbia, Québec and Canada

	British Columbia	Québec	Ontario
Production Services Tax Credit	**28%** *of qualified BC labour expenditure*	**20%** *of all Québec production expenditure*	**21.5%** *of all qualifying production expenditures*
Film and Television Tax Credit	**35%** *of qualified BC labour expenditure*	**28%** *of eligible labour expenditure to a maximum of 50% of production expenditure*	**35%** *of eligible Ontario labour expenditures*
Animation and VFX	**16%** *of eligible labour expenditure*	**16%** (Production Services Tax Credit) **8%** (Film and Television Production Tax Credit) *of eligible labour expenditure*	**18%** *of eligible labour expenditure*
Regional Tax Credit for Animated Productions	**6%** (Production Services Tax Credit) **13%** (Film and Television Production Tax Credit) *of eligible prorated labour expenditure (incurred in BC outside of the designated Vancouver area)*		
Distant Location Regional Tax Credit for Animated Productions	**6%** *of eligible prorated labour expenditure (incurred in BC in a distant location)*		

4. Ontario's Computer Animation and VFX Industry: Financial and Economic Overview

The report so far has described the global market and industry, and features of the industry in Ontario. What follows is a profile of Ontario's computer animation and VFX companies – what they earn and spend and the impact their activities have on the provincial economy.

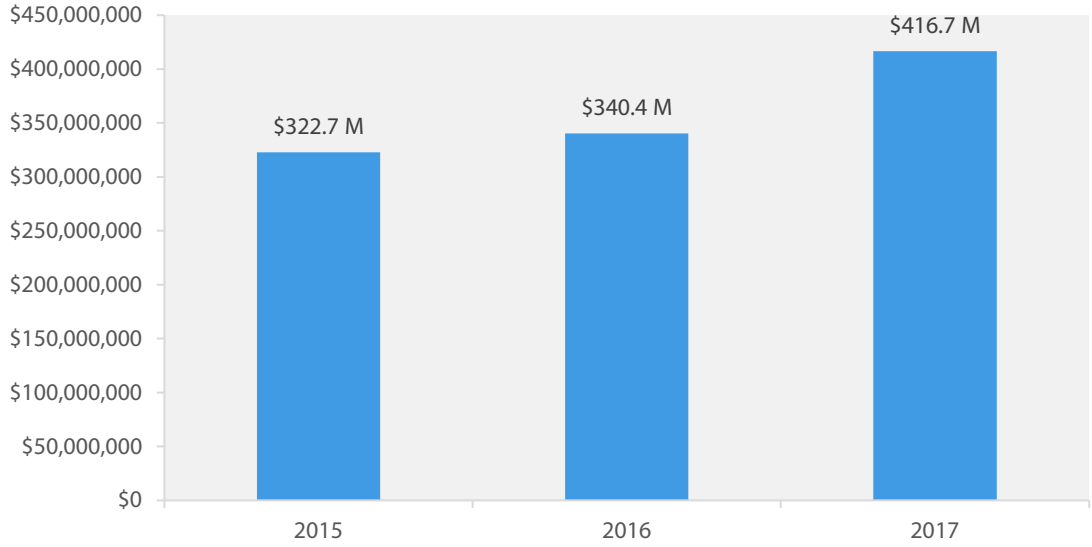
4.1 Financial Profile

This section details average revenues (including where they're sourced from) and expenditures of companies in the industry, and gross revenues and expenditure generated by the industry as a whole.

4.1.1 Revenue

Overall, Ontario's computer animation and VFX industry earned **$416.7 million** in **revenue** in 2017. The gross revenue in the last three years is shown in the figure below.

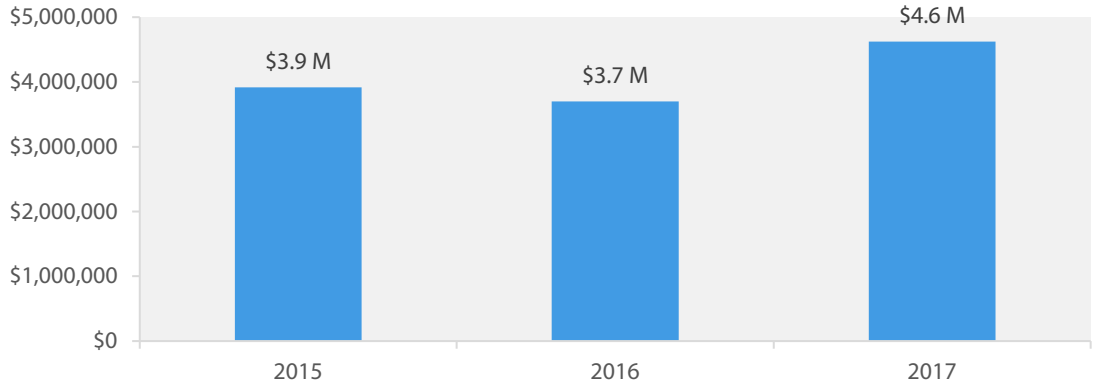
Figure 17: Gross industry revenue earned by Ontario's Computer Animation and VFX industry



n = 26
Source: Survey of Ontario's Computer Animation and VFX Industry 2018

The increase in revenue is consistent with the growth in production volume in Ontario detailed in Section 3.2.1, the increased global demand for animation and VFX described in Section 2.1, as well as the growth in the tax credit disbursed by Ontario Creates described in section 3.3. This growth trend is not reflected in the average revenue earned by the typical company which experienced a decline in 2016, seen in the figure below.

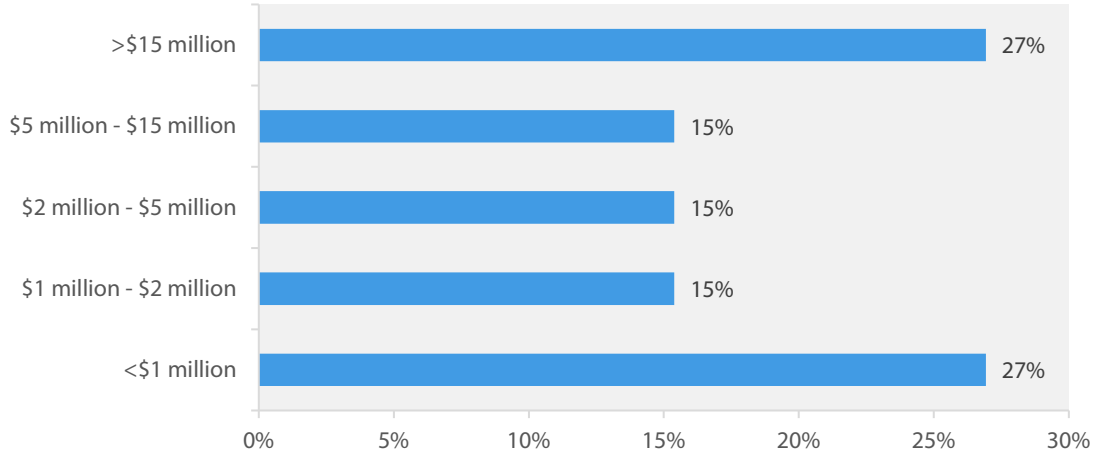
Figure 18: Average annual revenue reported by Ontario's Computer Animation and VFX companies [32]



n = 26
Source: Survey of Ontario's Computer Animation and VFX Industry 2018

The industry as a whole experienced growth in revenue over the last three years despite the typical company experiencing a decline in 2016. This difference demonstrates the significant role that large companies play in the growth of the industry, despite constituting just over a quarter (27%) of the companies. A majority (58%) of the industry makes lesser than $5 million annually, as seen in the figure below.

Figure 19: Annual revenue reported by Ontario's Computer Animation and VFX companies



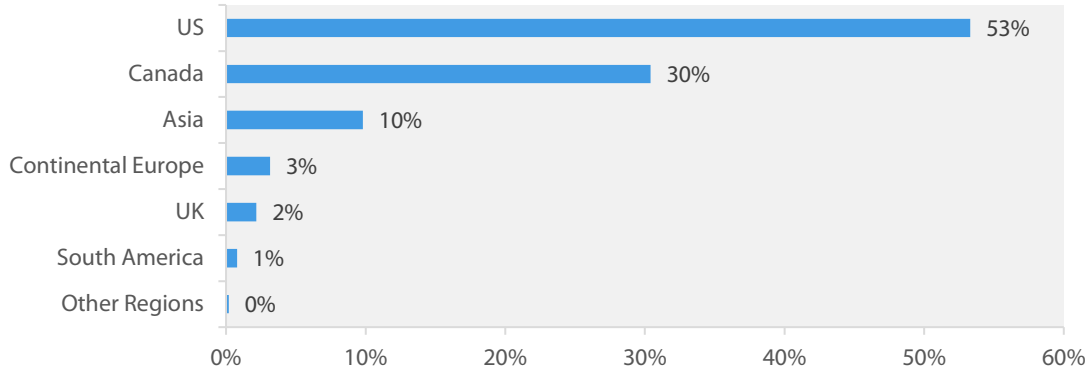
n = 26
Source: Survey of Ontario's Computer Animation and VFX Industry 2018

Looking at where companies source their revenue from, it is not surprising that companies made over half (53%) their revenue on average from customers in the US and 10% from Asia. There is significant

[32] Average excludes companies that earned more than $20 million in revenue in 2017

market potential in China whose comic and animation market was worth 150 billion yuan in 2017, and is expected to grow by 44% to reach 216 billion yuan in 2020.[33]

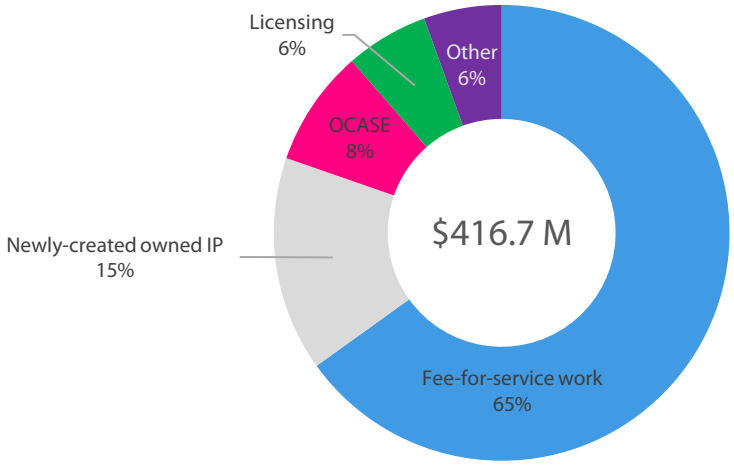
Figure 20: Revenue by market reported by Ontario's Computer Animation and VFX companies



n = 27
Source: Survey of Ontario's Computer Animation and VFX Industry 2018

Fee-for-service work is the largest source of revenue for the industry, with companies making 65% of their revenue on average from service work. Companies interviewed report that they are slowly increasing their investment in IP creation,[34] earning around 15% of their revenue from newly-created owned IP.

Figure 21: Breakdown of revenue earned by source by Ontario's Computer Animation and VFX companies



n = 29
Source: Survey of Ontario's Computer Animation and VFX Industry 2018

[33] The Straits Times, China's tech giants splash out in cartoon arms race, June 25, 2018. https://www.straitstimes.com/asia/chinas-tech-giants-splash-out-in-cartoon-arms-race

[34] Source: Interviews conducted as part of the 2018 Study of Ontario's Computer Animation and VFX Industry

Streaming platforms and SVODs have become a prominent source of revenue for companies that earn revenue from licensing and newly-created owned IP. They earned on average 22% of their revenue from Over-the-Top streaming services (e.g., Netflix, Amazon Prime, CraveTV).

While there is plenty of fee-for-service work to go around, the traditional aspiration for service companies has been IP ownership. Some companies that create their own properties reported taking on service work to retain staff and address any gaps in financing (e.g., while waiting for bridge loans to close).

Computer animation companies going into production where IP ownership is the objective do so in collaboration with other specialists in the production sector (e.g., financing, foreign sales, and live action production).

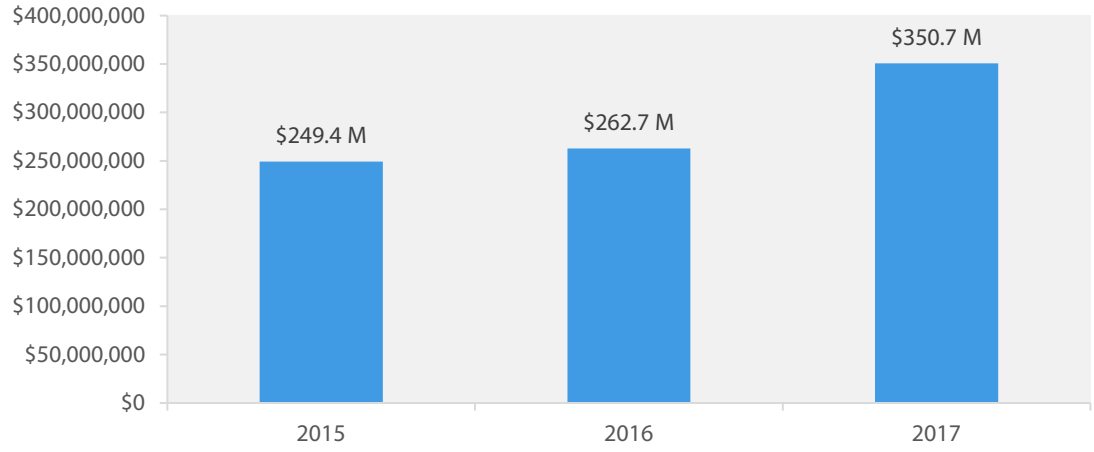
For the VFX studio, IP is mostly related to technology innovations which are by nature easier to commercialize. For example, one company that Nordicity interviewed sold rights to some of their 3D creature models and worked as co-producers on the short film that used them.

There are opportunities for IP ownership of productions made-for-the-Internet, as one studio in Ontario demonstrates. This studio moved from exclusively fee-for-service work to producing content for YouTube; and have recently re-packaged their content for TV. This example illustrates one of the ways in which service studios can diversify or build revenue-generating assets.

4.1.2 Expenditures

Overall, the computer animation and VFX industry spent an estimated **$350.7 million** in 2017. The gross expenditure for companies in this industry between 2015 and 2017 is shown in the figure below. Like the gross revenue, the trend in expenditure reflects the growth seen in production volume, and global demand for animation and VFX.

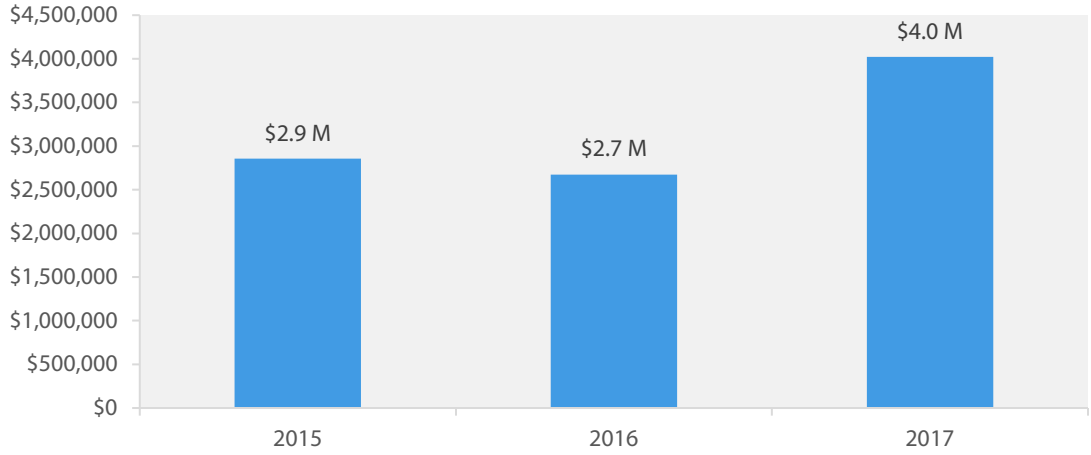
Figure 22: Gross annual expenditure of Ontario's Computer Animation and VFX industry



n = 26
Source: Survey of Ontario's Computer Animation and VFX Industry 2018

This growth in industry spending is likely driven by large companies as described in the previous section. The typical company however, experienced a decline in spending in 2016, as seen in the figure below.

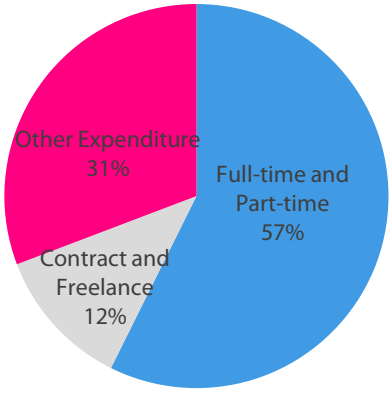
Figure 23: Average annual expenditure of Ontario's Animation and VFX companies[35]



n = 26
Source: Survey of Ontario's Computer Animation and VFX Industry 2018

The largest category of expenditure is labour, with wages and salaries constituting 69% of a company's annual expenditure on average.

Figure 24: Breakdown of expenditure reported by Ontario's Computer Animation and VFX companies



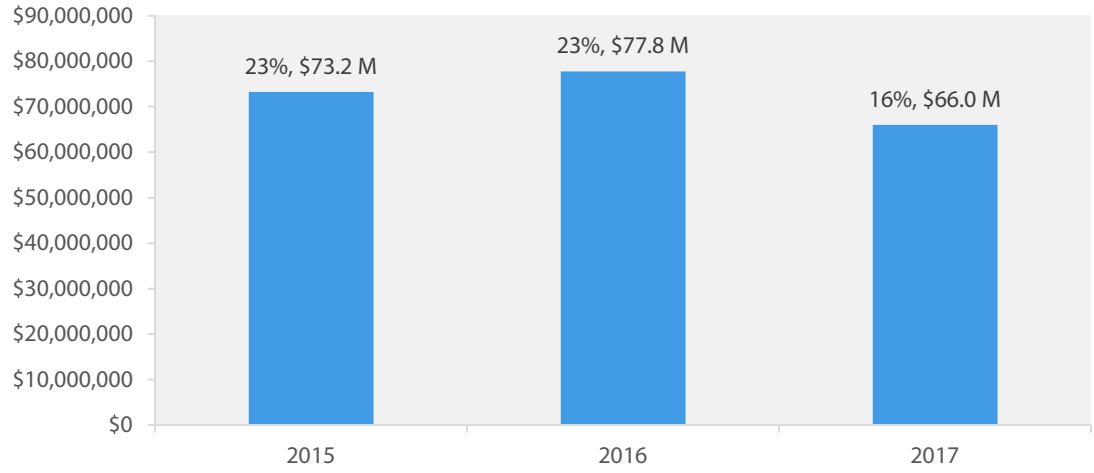
n = 26
Source: Survey of Ontario's Computer Animation and VFX Industry 2018

4.1.3 Operating Margins

Operating margin for the industry was estimated to be **$66 million** or 16%. Margins have declined over the last three years as depicted in the figure below. Interviews suggest that this decline is likely due to competition and rising customer expectations.

[35] Average excludes companies with expenditure of more than $18 million in 2017

Figure 25: Gross annual operating margin for Ontario's Computer Animation and VFX industry



n = 26
Source: Survey of Ontario's Computer Animation and VFX Industry 2018

Some service studios have noted an increase in the number of projects over the last three years but are concerned about declining project budgets. Interviewees report that to remain profitable, they propose flatter project teams, inherently providing more work for junior workers.

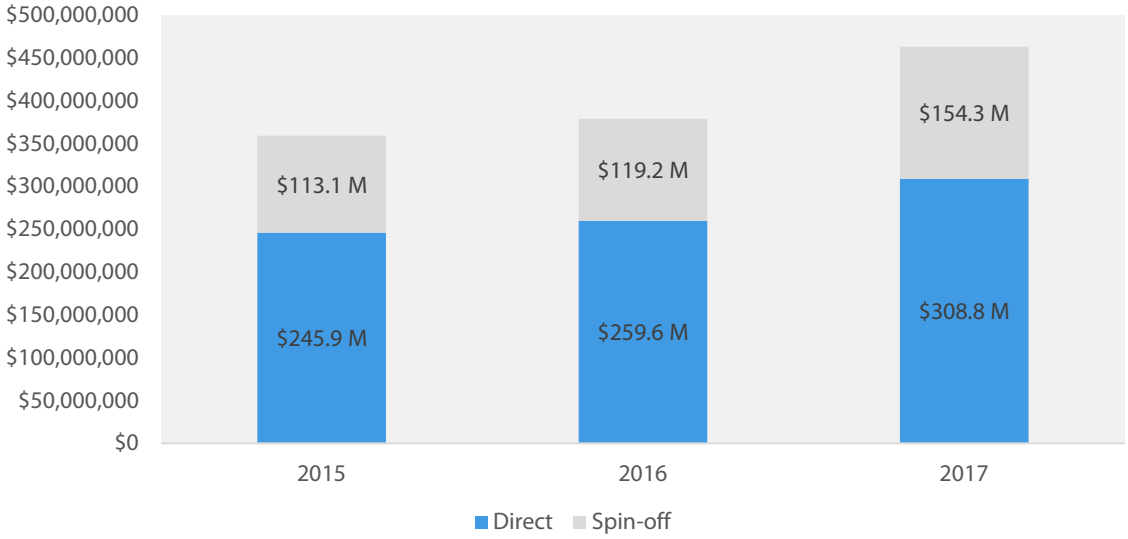
> "We often use OCASE as gap financing and get concerned with the tethering of the OCASE with OPSTC or OFTTC will delay current processing times for our corporate tax credit. We rely on OCASE to further develop IP, hire more artists, acquire software and hardware along with do research and development on new innovations for their studios.
>
> While Ontario Creates has implemented recent process improvements, our studio would be more competitive in both international and domestic markets if the vendor own tax credits were realized faster.
>
> - Industry Stakeholder

4.2 GDP Impact

The operating margin of the industry and the its expenditures have an impact on Ontario's economy, which can be measured in terms of GDP, taxes and employment. As described in Section 1.1.4, the economic impact can be articulated in terms of direct and spin-off impacts.

The total **direct** GDP impact of activity in the computer animation and VFX industry on the provincial economy is estimated to be **$308.8 million** for the 2017 fiscal year. The figure below shows the GDP impact broken out into direct and spin-off impacts.

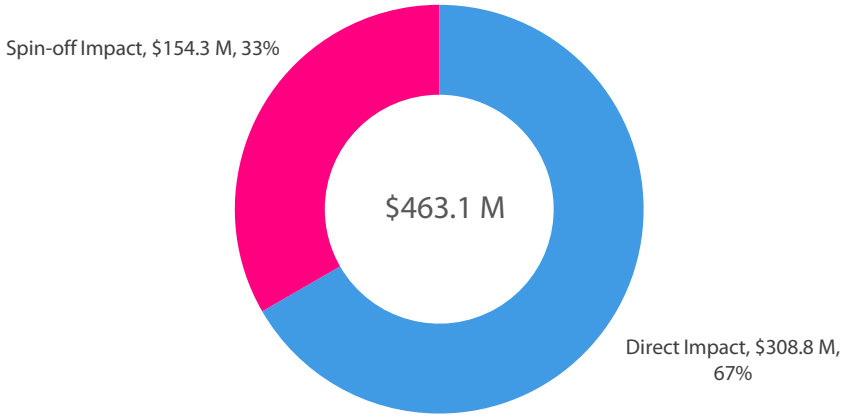
Figure 26: GDP impact of Ontario's Computer Animation and VFX industry



Source: Nordicity MyEIA Model, Statistics Canada, federal and provincial government accounts.

As seen in the figure below, the **spin-off impact** of the industry in 2017 is estimated to be **$154.3 million**. The **total** combined economic impact of the industry (direct + spin-off) is estimated to be **$463.1 million**, which is 6% higher than the industry's economic impact in 2016.

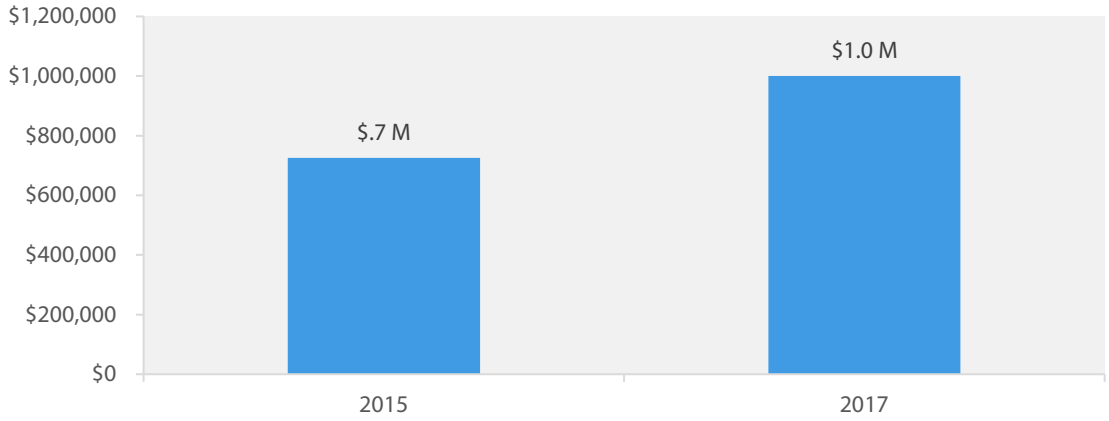
Figure 27: Economic impact of Ontario's Computer Animation and VFX companies – GDP



Source: Nordicity MyEIA Model, Statistics Canada, federal and provincial government accounts.

The GDP growth since 2015 outpaces the growth in tax credit disbursement. As such, the tax credit is a more efficient means of industry support in 2017 than it was in 2015, as the following chart illustrates.

Figure 28: GDP Contribution per $100,000 of OCASE Tax Credit Disbursement



Source: Nordicity MyEIA Model, Ontario Creates tax credit data

For every $100,000 of tax credit expenditure, the industry produced $1 million in direct GDP impact in 2017, compared to $726,000 per $100,000 invested in 2015. The continued utility of the credit rests, in part, in the ability of Ontario-based companies to predict how OCASE will be administered. Fortunately, the Ontario government's announcement in November 2018 that "[t]he government is committed to providing stability and support for this key industry, while reviewing all business support programs. Ontario's existing tax credits help ensure the industry continues to contribute to the Ontario economy" should help studios to incorporate the tax credit into their respective business strategies.

4.3 Fiscal Impact

Companies in the industry contribute to tax revenue at the federal and provincial level through multiple channels, namely, personal income taxes, corporation income taxes (based on profits), consumption taxes and local property taxes. A detailed breakdown of the fiscal impact in 2017 can be seen in the table below.

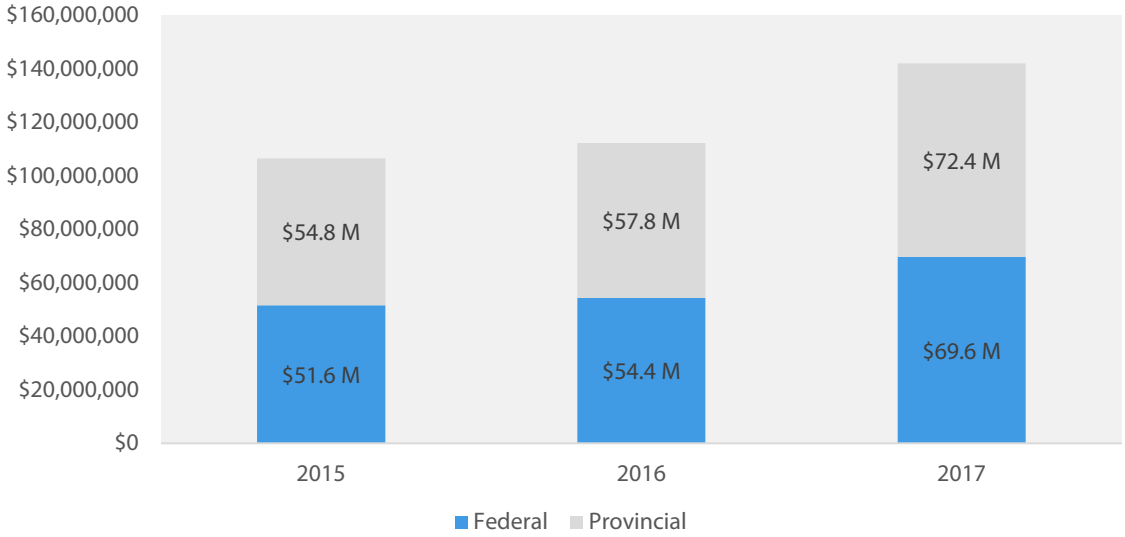
Table 2: Fiscal impact of Ontario's Computer Animation and VFX companies

	Federal	Provincial	Total
Personal income taxes	$53.5 M	$31.0 M	$84.5 M
Corporation income taxes	$6.0 M	$4.3 M	$10.3 M
Consumption taxes	$10.1 M	$16.6 M	$26.7 M
Local property taxes and other fees	$.0 M	$20.5 M	$20.5 M
Total	**$69.6 M**	**$72.4 M**	**$141.9 M**

Source: Nordicity MyEIA Model, Statistics Canada, federal and provincial government accounts.

The industry contributed an estimated **$142 million** in taxes in 2017. The chart below shows the breakdown of the fiscal impact in terms of federal and provincial tax impacts. In all, the industry has contributed an estimated **$185 million** in taxes to the Province in the last three years.

Figure 29: Tax impact of Ontario's Computer Animation and VFX companies



Source: Nordicity MyEIA Model, Statistics Canada, federal and provincial government accounts.

5. Ontario's Computer Animation and VFX Industry: Employment and Skills

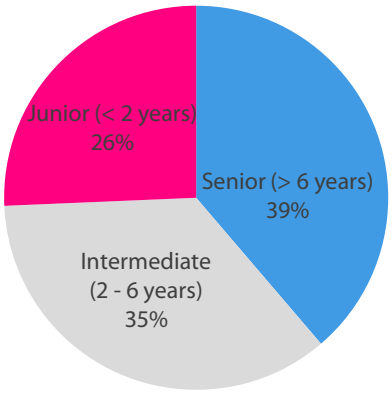
Ontario's computer animation and VFX industry relies on highly-skilled creative and technical labour. This section describes the workforce in terms of experience, education, skills and compensation. It also quantifies the employment impact of the industry in terms of direct and spin-off impacts. Finally, it provides an analysis of skills and education required to work in this industry.

5.1 About the Workforce

In a positive development, the interviews revealed that the workforce is becoming more gender-balanced with a greater number of women studying computer animation and VFX, and then entering the industry. Some companies have initiatives in place to address gaps, but most companies have noticed the workforce become more balanced, without any intervention on their part. Student enrollment at post-secondary institutions is more gender balanced, but there is a noticeable lack of female instructors and industry mentors.

> "We've never really hired that way deliberately, we hire the best talent and as a result we have a huge mix of backgrounds at our company. Over 50% of our leads are women. I think it is because we are a somewhat younger studio on average."
>
> - Industry Stakeholder

Figure 30: Breakdown of workforce by seniority at Ontario's Computer Animation and VFX companies

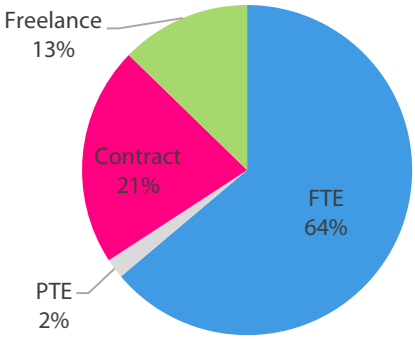


n = 25
Source: Survey of Ontario's Computer Animation and VFX Industry 2018

Senior employees (i.e., employees with more than six years of experience) constitute the largest portion of the workforce at 39%, which is different from other industries. Evidently the industry is driven by experienced workers with companies relying heavily on their senior talent. Anecdotal evidence also suggests that studio in Ontario have some difficulty hiring junior animators, with companies often pointing to the significant investment needed to up-skill new talent. This challenge may be contributing to the reliance on more experienced workers.

This industry relies heavily on temporary labour as seen in Figure 27, with contract and freelance workers constituting one-third (34%) of the workforce.

Figure 31: Breakdown of workforce by type at Ontario's Computer Animation and VFX companies



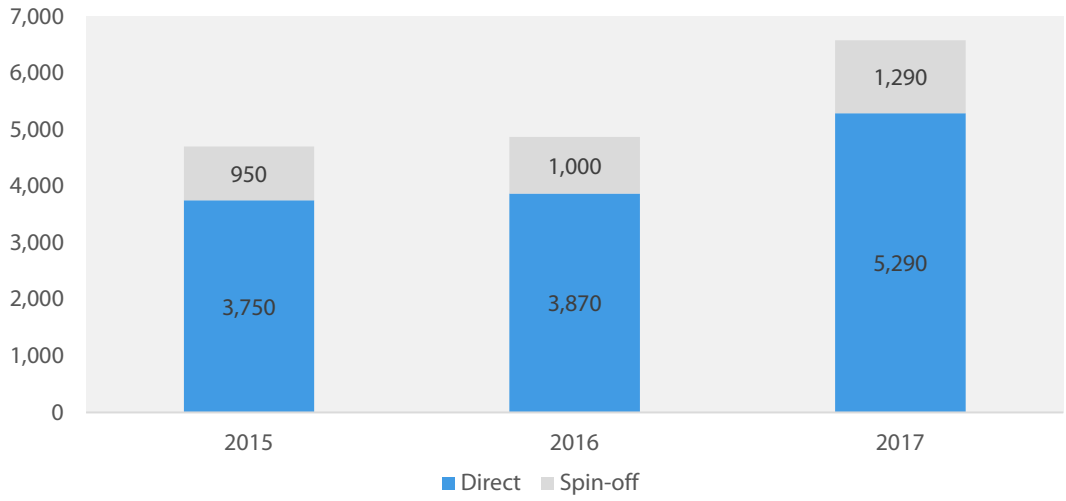
n = 25
Source: Survey of Ontario's Computer Animation and VFX Industry 2018

The workforce is largely Canadian with only 13% being hired from outside Canada. Stakeholders lamented that the local talent pool for experienced professionals is limited and competitive, and that they often lose employees to each other, and to better paying markets such as Montreal and Vancouver. Interviews indicate that companies try to retain talent by offering work-life balance and good corporate culture.

5.2 Direct and Spin-off Employment Impact

Overall the industry contributed **5,290 FTEs** in **direct** employment and **1,290 FTEs** in spin-off impacts to the province. This direct impact has grown by 35% in the last three years.

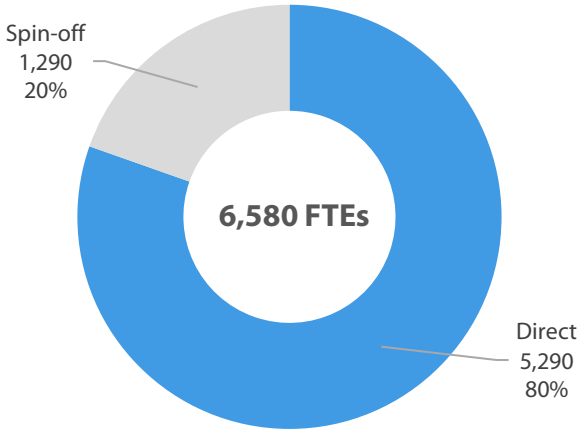
Figure 32: Employment (FTEs) impact of Ontario's Computer Animation and VFX industry



Source: Nordicity MyEIA Model, Statistics Canada, federal and provincial government accounts

The total number of jobs (direct + spin-off) supported by this industry is estimated to be **6,580 FTEs**, which is 40% higher than the jobs supported by the industry in 2015.

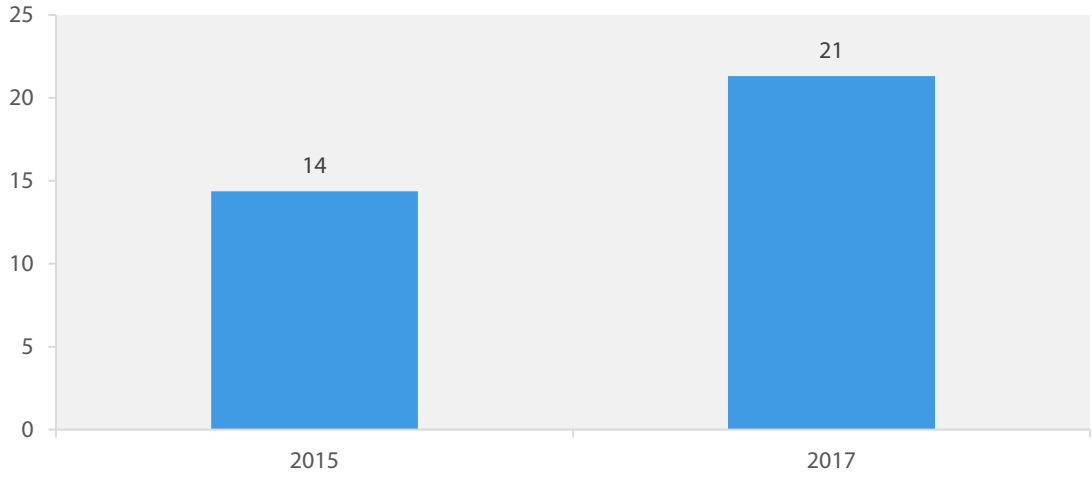
Figure 33: Economic impact of Ontario's Computer Animation and VFX companies - jobs created



Source: Nordicity MyEIA Model, Statistics Canada, federal and provincial government accounts

Much like the GDP contributions, the number of FTEs supported for the provincial investment in OCASE has increased significantly since 2015, as depicted below:

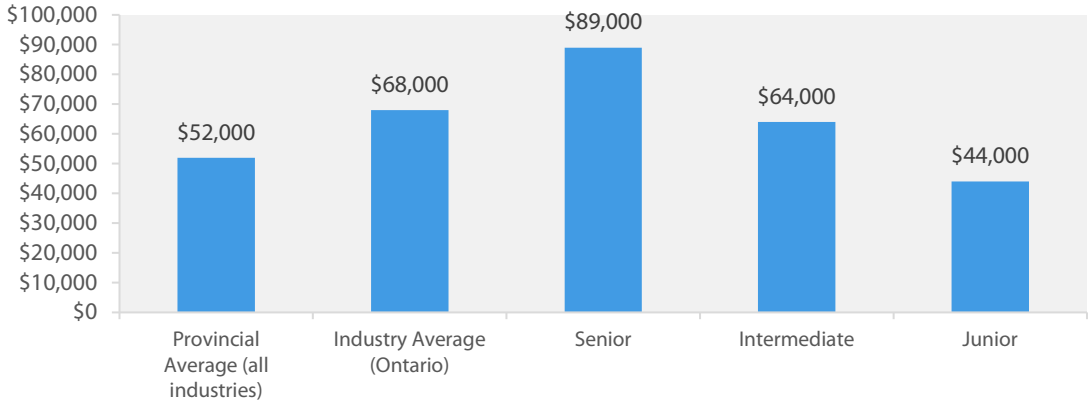
Figure 34: FTEs of Employment per $100,000 of OCASE Tax Credit Disbursement



Source: Nordicity MyEIA Model, Ontario Creates tax credit data

The employment impact was estimated using average full-time salary information provided by companies in the survey. As seen in the figure below, senior full-time employees earn almost $90,000 per year while junior full-time employees earn around $45,000.

Figure 35: Average FTE salary and contractor wages at Ontario's Computer Animation and VFX companies



n = 25
Source: Survey of Ontario's Computer Animation and VFX Industry 2018; Statistics Canada, Table 14-10-0204-01 Average weekly earnings by industry, annual

The industry average of $68,000 which was derived from survey responses is $16,000 higher than the average salary in Ontario, indicative of the high-paying jobs supported by this industry. Because these salary figures blend a wide variety of animation and VFX position (across three levels of seniority) directly comparable data is not available for Ontario's domestic competitor (i.e., British Columbia and Quebec). That said, recent data suggests that median salaries in BC's animation and VFX industry are raising rapidly, with entry-level animator and VFX compositor salaries increasing 11% and 12% respectively from 2017 to 2018.[36] As such, keeping the effective cost of labour lower in Ontario is likely to continue to be a key competitive advantage.

5.3 Skills and Education

There are several institutions in Ontario specializing in computer animation and VFX. Over half the workforce (55%) was hired directly from these post-secondary institutions.[37]

Seneca and Sheridan appear to be the most popular institutions for hiring interns and graduates, although companies also hire from Humber, Centennial and George Brown, among others.[38]

> "We have a different dynamic in our studio compared to traditional ones – everyone is a generalist. I don't have divisions, I have artists who can do everything."
>
> - Industry Stakeholder

The average education level at companies was Certificate/Diploma, and institutes we interviewed have noted that mid-career artists are returning to school to transition into production roles.[39] Interviews indicate that companies are hiring more generalists than specialists, partly as a talent

[36] HR Tech Group, *BC' Tech Salary Survey* (2018)

[37] Source: Survey of Ontario's Computer Animation and VFX Industry 2018

[38] Source: Interviews conducted as part of the 2018 Study of Ontario's Computer Animation and VFX Industry

[39] Source: Interviews conducted as part of the 2018 Study of Ontario's Computer Animation and VFX Industry

retention strategy and partly due to low availability of specialized talent. Some companies report finding it difficult to hire animators as well as rigging and lighting artists.

Interviews also suggest that new hires from VFX programs are able to hit the ground running with a few weeks of training. On average, new hires need around **eight weeks** of **training** to become productive members of their teams.[40]

In the survey, Nordicity asked companies to identify which **skills** were critical for success in 2015 and in 2018. Respondents indicated that **soft skills** such as organizational, teamworking, and business development skills are just as **important** now as they were earlier. On the other hand, **character design** and **Adobe CS production** are **less important** now than they were three years ago.

[40] Source: Survey of Ontario's Computer Animation and VFX Industry 2018

6. Strategic Outlook for Ontario's Computer Animation and VFX Industry

As Ontario's computer animation and VFX industry operates in a competitive global environment, it must be constantly reacting to competitors and exploiting new market opportunities outside Canada. Studios, post-secondary institutions, government policies need to be effective to best position the sector for continued success and faster growth.

6.1 Challenges Facing the Industry

In the survey of computer animation and VFX firms, feedback was obtained about what factors companies perceive to be most limiting the growth of their business. Figure 31 below shows respondents' ranking of various factors as to the degree to which they may be affecting growth - on a scale from zero or "Not a limitation" to three or "Main Limitation".

Figure 36: Factors limiting growth identified by Ontario's Computer Animation and VFX companies

n = 25
Source: Survey of Ontario's Computer Animation and VFX Industry 2018

Competition from international companies for service work was identified by a majority (58%) of the respondents as either the main limitation or a key limitation to growth. The industry is becoming increasingly global and interviews revealed that companies are concerned about maintaining their competitive advantage in the Canadian and global markets.

Availability of skilled labour is ranked (marginally) lower as a concern than *competition from international companies*, and the *supply of management, marketing and sales expertise*. It is a possible indication that scarcity of skilled creative or technical workers can be resolved if the work is present for such workers. At the same time, management, marketing and sales expertise do not scale to a studio's workload to the same extent.

Access to affordable capital was identified as the next most important factor. Interviewees indicated that external corporate investment is rare and that they largely use their own money to invest in new product lines, unless they have a parent company they can rely on.

The large Canadian banks have lending products specific to the film and television industry, but companies bemoaned the lack of affordable financing due to banks charging high interest rates for loans without security.

6.2 Opportunities Going Forward

Computer animation and visual effects are growth areas in the screen-based entertainment sector – both for large feature films, but also content for streaming services and conventional television. The SVODs are buying more content than ever, and technology is becoming less expensive to acquire in the subscription model. Producers and studios continue to spend huge amounts on VFX and new avenues for storytelling have emerged in the form of VR/AR/XR. All that should bode well for those in the computer animation and VFX (especially) sectors. However, Ontario's Canadian competitors – BC and Quebec – have been growing faster than Ontario in this sector over the last few years.

Ontario companies have been caught in a bit of a squeeze. They are not global enough, or not enough linked to global supply chains to grab the business generated by the very large projects. The number of these big projects has not grown in terms of annual projects. The business from TV series (whether for television or streaming services) has risen considerably, but the projects tend to have lower budget (not 'low' but lower than mega films). The upshot, according to interviews, has meant that the buyers are very cost conscious. The evidence shows that indeed the margins have declined (see Section 4.1.3), likely to reflect the continual investments companies must make (both in terms of technology innovation and personnel) to keep up with their customers' expectations. Thus, Ontario firms have been less able to capture the very large projects and are having to compete for the TV productions against the world.

As indicated in this report, many Ontario firms have proven quite resilient – and have demonstrated that resilience in a variety of ways. They have rationalized or pruned businesses, gone after specific client types, evolved more IP-based business models, invested in technological innovation, and otherwise pivoted. They are up to the challenge, so what are the potential strategies for the CASO community to further position itself for growth? The following optional directions provide a rough process to enable growth in Ontario's computer animation and visual effects industry.

Creating a collaboration ethic: A more ambitious strategy would be to build on the range of strengths in the Ontario market. The industry could grow through the identification of collaborative strategies and being incentivized to work more together. Areas for collaboration include (but are by no means limited to) the following:

- Wage/talent collaboration, such as agreeing to wage thresholds so there may be less competition for talent;
- Developing (more formal) partnerships to share risk of developing and marketing new IP (be it technical or creative);
- Sharing of market intelligence and marketing to be in a position of collaboration in the bidding for major film effects productions;
- Aggregating purchasing power in the evolving subscription-based software and hardware assets to achieve greater flexibility in these arrangements;
- Increasing coordination of the computer animation and visual effects studios and Canadian (and international) film/TV producers (e.g., by way of joint white papers) towards building

consensus on the complexity of various types of work, pricing expectations, and/or timelines; such collaboration would moderate the extreme pressure on price; and

- Greater collaboration around R&D, such as testing the limits of the envelope with GPU processing and real-time rendering – possibly in conjunction with key vendors.

One outcome from this increased collaboration would be an improved ability to increase scale on a flexible, *ad hoc* basis. For example, companies would be further encouraged to compete for larger international projects in a manner that minimizes client liability. As such, the industry would gain much of the market positioning of having a large anchor company, without exposing the industry to the risk of the overhead created by a permanent large company.

Investing in IP: One potential outcome of more collaboration is an improved ability to invest in the creation of intellectual property. For computer animation companies, that might mean the creation of a new animated series whose rights can be exploited on the global market; for VFX companies, investments in IP could lead to technological innovations that could help to extend Ontario's industry a competitive advantaged (in a global market). Either way, it is likely that increased scale and/or improved collaboration will make it easier for companies to free up sufficient resources to invest in such activities.

While this report is not intended to make specific recommendations, it does provide a structure to examine what further measures could be explored by Ontario's computer animation and visual effective industry. As a critical technology-driven and creative component of the entertainment value chain – with a growing importance in the entertainment business – it will be important for the industry to consider various business, strategic, and potential public policy options. Such avenues may be pursued by the industry on its own, or in conjunction with other industry stakeholders and/or organization. While not the only reason for Ontario to be a powerhouse in screen-based production, it is important to have the animation and VFX industry in high growth mode for Ontario's to capture its share of the growing international demand for high-end production.